Railway Age

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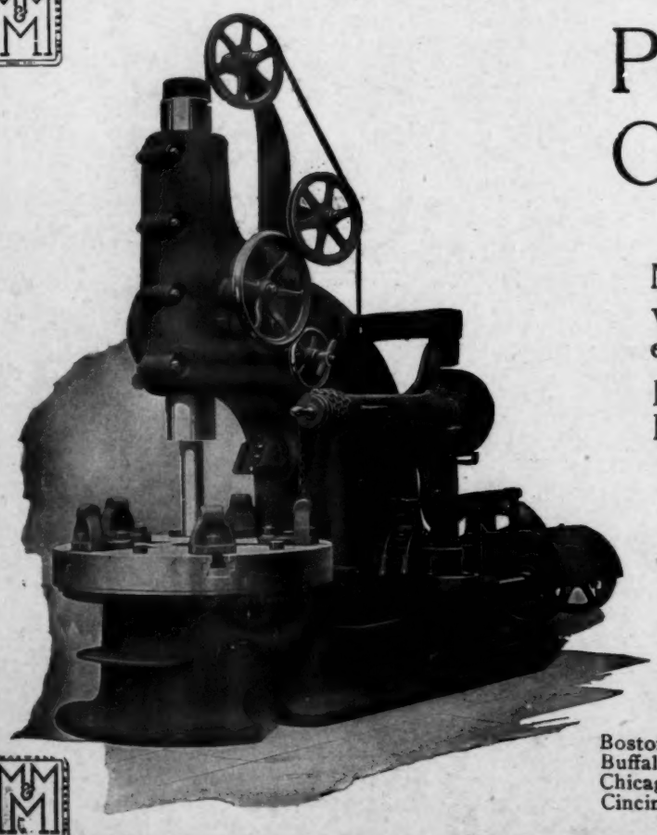

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EDITORIAL

Railway Age

Freight House Equipment

Americans have assumed for many years that the application of labor-saving equipment has been much more general in this country than in Europe. In fact, they have been inclined to take this condition for granted, assuming it to be a natural consequence of American progressiveness in overcoming the higher cost of American labor. It will, therefore, be a matter of no little surprise to most railway men in this country to note, as outlined on another page of this issue, the extent to which power freight handling equipment has been applied in a new freight terminal in Glasgow, Scotland. Obviously, that station has been designed to meet British conditions, and there is probably much in the installation that would not apply to an American freight house. Nevertheless, the article should give food for thought on the character of equipment that would be applicable to the needs here. In this country, the pioneer work in freight terminal facilities has been confined to a few roads, the others being content to adopt what the few have perfected. As a consequence, power devices in freight houses are restricted to one or two types of transportation or lifting equipment. More independent thinking and experimentation along these lines may bring forth other labor- and time-saving machinery that will repay the development costs many times over.

Railroad Annual Reports for 1918

The Pennsylvania, some weeks ago, sent to stockholders a brief financial statement for the year, 1918, accompanied by an announcement that the customary complete statistical report for the year was not within the province of the owning corporation since the road was being operated under lease by the government. The Boston & Maine has now followed with a somewhat similar announcement, and it may be that there are compelling reasons which will prevent the corporations from obtaining and compiling the usual statistical statements which are sent to the stockholder with the annual report. If this is so, however, it is most unfortunate for railroad security owners, and a holder of securities of a railroad corporation owes it to himself to make every effort to obtain a knowledge of the detailed operating expenses, the average train and car loading, the ton and passenger mileage handled, tonnage of commodities carried, etc., of the roads in which he is interested. Never has it been more important for the individual investor to study the figures showing the character of maintenance, cost of handling freight and passengers, and efficiency of operation than it is now. The corporate officers of the railroad companies have, to the best of their ability, been watching out for the interests of the security holders and for this purpose have been keeping in close touch with the federal managements of their properties; but it should be borne in mind, however, that in many instances there has been shown, on the part of the Railroad Administration when under Mr. McAdoo, a suspicion of the corporation officers. The administration has pursued a policy of secrecy about many matters, especially in regard to labor, and even if a corporation officer had good reason to believe that certain unfavorable developments had taken place in the management of the property which he was, in duty bound to his stockholders, required to protect, he could not make a full, frank statement of his opinion to the general public. There is another thing of great importance; where a property has been under the management of one man for a number of years, the annual reports naturally reflect something of the way in which this man views the operations of the property. Furthermore, it reflects the conditions which are, to a certain extent, the outcome of the will and desire of the board of directors and the president. Now, however, we have had a year of operation of railroad properties without this artificial molding of conditions. Of course, there are numerous temporary conditions which affected a particular railroad property because of the war, which must be allowed for, but the fact remains that this year a security holder who studies the statistics of operation of his railroad will get a view of the property from an entirely new angle. He has a chance to apply new tests unhampered by any desire on the part of the compiler of the annual report to follow traditions.

Important Reduction in Steel Prices

It is most unfortunate that the Railroad Administration should have been forced, by the failure of Congress to pass the revolving fund appropriation, to issue orders for drastic curtailment of improvement work just at the time that the steel manufacturers announced important reductions in the prices of their products. The railways are among the largest users of steel, and under ordinary conditions reductions in the costs of these materials such as those made last week would have led to greatly increased activity. For instance, it has been understood that the Railroad Administration has been prepared for some time to place orders for over one-half million tons of rails as soon as its demands for concessions in price have been made. Similarly large tonnages of track fastenings, bridge materials and other steel products are urgently needed. The problem of reconstruction is now a critical one for the entire country. At the same time the railways are urgently in need of repair and improvement work. It is therefore to be hoped that the Railroad Administration may find some way of overcoming its financial difficulties so that the roads may take advantage of the lower costs of construction and at the same time provide employment directly and in the plants of the supply companies for the surplus labor now available.

Report on A. S. A. Brake Tests

The elaborate series of tests of the Automatic Straight Air brake system conducted by the Bureau of Safety of the Interstate Commerce Commission, has, according to the report abstracted elsewhere in this issue, demonstrated to the satisfaction of the Bureau the substantial accomplishment of the functions for which the equipment was designed. There were several features of the equipment as furnished for these tests which were not considered ideal for the best results. None of these, however, was considered inherent in the principles of the design or functions of the brake. Among these are the ratio of cylinder pressure rise to brake pipe reduction, which

should be higher than the two-to-one ratio of the equipment tested; the requirement of practically full depletion of brake pipe pressure before obtaining the automatic emergency application; the difficulty of securing proper emergency action with the compensating valve, and the design of the equipment. The first two difficulties mentioned were considered to be matters of adjustment, and their elimination is contemplated in a simplified design. A modification of the engine equipment during the tests removed the third difficulty, and with the redesigned equipment it is proposed to demonstrate the ability to perform its functions without the use of the compensating valve on the locomotive. Aside from the comprehensive nature of the tests, they are remarkable from the fact that a complete graphic record was taken of the performance on the brake on every car in each of the trains tested, and when its formal presentation to Congress makes the entire report available it will offer an unusually complete fund of data on the subject of train control.

Contributions to Railroad Efficiency by the Railway Supply Industry

THE NEW YORK RAILWAY CLUB performed a most important service at its meeting last week in outlining clearly and forcefully the intimate relationship that must necessarily exist between the railway managements and the railway supply interests in the matter of improving the efficiency and economy of railway operation. It is well that the important —indeed, almost immeasurable—contributions which have been made by the railway supply companies toward this end should be more generally and more fully appreciated.

The railway supply companies are in sharp competition, one with another. To live and prosper they must constantly strive to produce better products than their competitors and at the lowest possible prices. This requires them to keep in intimate contact with the requirements of the roads and with the development of that phase of railroading in which they are particularly interested. Not only is it necessary to build up strong engineering departments but, in many cases, it has been found desirable and even absolutely necessary to install service departments to follow the devices or equipment after they have been placed in service and see that they are properly operated and maintained. These service departments have had to carry on extensive and intensive educational programs; this fact is not sufficiently appreciated by the railways. It is not uncommon, for instance, for a railway supply engineer or expert to be called upon for advice on problems which have little, if anything, to do with the devices or equipment in which he is specially interested. The air brake expert is not infrequently called upon for advice as to train operation—questions which are not always directly related to the use of the air brakes but which he is usually competent to answer because of his broad experience and his contact with the practices on other roads. Experts having to do with devices to produce better combustion often make valuable practical suggestions as to factors involved in combustion as a whole which have little, or nothing, to do with the particular device in which they are specially interested, but which do contribute to the securing of better results.

The engineer on a railway must necessarily cover a wide range of activities; there are comparatively few railway designers or experts that can give an unlimited amount of time for concentration on one particular problem. The railway supply engineer or expert, on the other hand, can give his undivided attention to the development or improvement of one particular device and may even find it necessary to build up a strong staff of experts about him. This staff finds it necessary to study conditions on many roads having widely varying characteristics. Any improvement that may be suggested by special conditions at one place can be followed up and studied critically. It may be found wise to incorporate the new feature as a permanent improvement in the device, thus making it more valuable for use even under ordinary conditions.

It is well that railroad men should understand the value and extent of these services. It is exceedingly important that those in charge of purchasing should realize what these things mean to the railroads and should take them into consideration. There is an impression on the part of many of the railway supply men that those in authority, had they thoroughly understood these matters, would, in many cases, have adopted a somewhat different attitude in dealing with the railway supply men during the past year. It is well, therefore, that the New York Railroad Club focused attention upon the matter as well as on the necessity of a closer co-operation between the railroads and the supply companies looking toward a more uniform production of material, thus aiming to make it possible to maintain more uniform and stronger manufacturing organizations, increasing the efficiency of production and, of course, reducing the cost of the equipment to the railroads to a minimum.

Railroad Men's Terms of Subscription to the Victory Loan

THE RAILROAD ADMINISTRATION has announced that railroad officers and employees may subscribe to the Victory Loan through the federal treasurers of their companies on a 10 per cent per month installment plan. Walker D. Hines director general, has issued a circular (No. 63) urging officers and employees to subscribe to the loan either through the railroad federal treasurers or through any local bank. Interest will be allowed on installments at the same rate as the interest carried on the Victory Loan.

The railroad organization for handling the loan consists of a general committee headed by the federal manager for each road, assisted by a general office committee, divisional committees, terminal committees, and shop committees. The committees are to report daily to the general committee, which in turn is to report to the regional director. Every officer and employee of the roads under federal management will be solicited personally, but the director general especially cautions against allowing any employee to feel that his action is influenced by fear of coercion or of criticism. The loan drive begins on April 21 and lasts until May 10.

As previously announced, the loan is to be divided into four classes, presumably bearing different rates of interest, the lowest rate being for a class of notes entirely tax free, except for inheritance taxes, while the highest rate of interest, the fourth class, is for notes tax free from income taxes only, and from these taxes only up to $40,000. Secretary Glass recently said, "We are not going to approach the last popular war loan strictly in a commercial spirit. . . . We must and will appeal to the patriotism of the American people. . . ." It is well to remember that our country's obligations are our obligations and that the raising of the Victory Loan is merely carrying out obligations already entered into.

Put purely on a commercial basis, however, the Victory Loan should appeal particularly to railroad men. There are thousands of railroad employees and probably hundreds of junior officers of railroads who have been successfully and systematically saving money—becoming capitalists—for the first time in their lives through their purchase, on the installment plan, of the various issues of Liberty Loans. The terms offered by the Railroad Administration are very

liberal. When a man stops to think how large a proportion of his first premium payments on life insurance goes to pay the cost of soliciting the policyholder—commissions to solicitors—he can appreciate better the liberality of the Railroad Administration now, and of the railroad companies in the past, in undertaking, free of all charge or commission, this work of solicitation.

Every subscriber to the Liberty Loans on the installment plan knows that, except for emergencies, the regular saving, month by month, of a fixed percentage of his pay is a habit not hard to acquire and one which gives a feeling of satisfaction and self-respect that is priceless.

In making the first four Liberty Loans the great successes that they were, certain classes of citizens gave of their time and energy more than others, but no amount of giving on the part of bankers and a few other restricted classes would have made the bond sales the success that they were had not all classes of citizens, consciously or unconsciously, aided in the distribution of these bonds. There were 21,000,000 subscribers to the $7,000,000,000 Fourth Liberty Loan, and it cost the government just $8,727,658 for the campaign, a cost of less than 1/8 of 1 per cent of the total amount.

Such a great majority of all the railroad men in the country were subscribers to one or more of the Liberty Loans that the work of introducing the investment to them should, in the case of the Victory Loan, be almost nil. It is rather a question of arousing enlightened self-interest and yet this should not be difficult. Systematic saving is an absolute requirement for success in life whether a man be earning $100 a month or $1,000 a month. Never before has there been such an opportunity to save on such advantageous terms, or in so easy a way.

The Price of Development

NO ONE WILL QUESTION the statement that the path of the promoter of automatic train control devices has been a hard one. Each recurring collision has brought a demand for devices which will make their repetition impossible, but up to the present time the devices of this kind have with few exceptions received scant recognition and support from railway men. Instead, the general attitude has been such as to discourage the development of such devices rather than to lend sympathetic co-operation sufficient to demonstrate their possibilities or weaknesses. It is true that many of the devices have been so evidently impracticable as to render demonstration unnecessary, but on the other hand the railways have set up requirements so rigid as to be almost if not entirely impossible of fufillment with a new and necessarily imperfect device.

The Railroad Administration is to be commended for its recent action appointing a committee to investigate the devices which have been developed, while the committee itself has shown a laudable desire to accomplish real results by drawing up a set of requirements, which, while rigid, are within the possibility of attainment in the present state of development of automatic train control apparatus. The committee has also indicated that it does not expect to find a perfect and practical form of control at once, but it is looking for those systems which most nearly approach this ideal. With this in view, it is now making an inspection of those systems which are in actual use.

In connection with its first inspection, which was made of the installation on the C. & E. I. last week, attention may also well be called to the necessity of complete co-operation on the part of the railways, for this support is essential to the development of a device the practicability of which must be demonstrated, not in the laboratory or shop, but under actual service conditions in the track. In this instance the management of the C. & E. I. has co-operated fully, both in the four-year period of initial experiments and in the four years following, during which the apparatus has been perfected in actual service on a complete engine district. Not only has the road lent its sympathetic support to this development, but it has suffered interferences to traffic and other conditions inherent in the early stages of important developments of this character. For this contribution to the science of railroading the management of the C. & E. I. deserves commendation.

New Books

American Methods in Foreign Trade. By George C. Vedder. Size 5½ in. by 8 in., 205 pages. Bound in cloth. Published by McGraw-Hill Book Company, 239 West 39th Street, New York. Price, $2.00.

If this book did nothing more, it would make itself worth while for the emphasis it places on the idea that the American manufacturer who engages in foreign trade will make the most of his opportunities by following out the same policies that brought him success at home. When all is said about German or other competition, says Mr. Vedder, the fact remains that the successful American manufacturer in foreign trade has come out the better because, unlike his competitors, he has sold not on a price or quantity basis, but on the basis of quality and service which characterizes the most successful businesses in domestic industry. Mr. Vedder in his book has outlined in readable fashion the best methods to be followed in developing a foreign trade.

He is more or less iconoclastic in his views, but most of his readers will agree with him that most of the obstacles that have been alleged to exist against American export trade are chimerical. Mr. Vedder, in particular, demolishes the idea that the Germans were excellent exporters. He says that many American concerns were competing successfully against German merchants before the war. He has no respect whatever to express in favor of the much vaunted German foreign banking system which he says made more ill-feeling than good will with those with whom it dealt.

There will be those who will disagree, however, with some of Mr. Vedder's ideas, and particularly with his views on the Webb-Pomerene bill permitting combination in export trade. He says that it is contrary to our own beliefs as expressed in the anti-trust laws in this country. "That two measures (this and the Sherman Law), so contradictory morally can long remain on the books and be effective, is incredible." In his chapter on this subject, Mr. Vedder seemingly misses the point that the reason the Webb-Pomerene bill was pased was not so much to relieve exporters from the operation of the Sherman law, although that, of course, was intended, as to clear up the darkness and uncertainty surrounding the operation of that bill. Mr. Vedder also apparently misses one of the big points of all our anti-trust legislation. He will admit that it has been directed at restraint of trade but apparently forgets that one of its biggest aims has been also to restrict monopoly. He does not see that the Webb-Pomerene bill has much in common with this legislation. It is aimed to encourage, not restrain export trade, by permitting the manufacturer to go out into the markets of the world fully armed in an organization of manufacturers like himself not hindered at every step by fear of persecution under a statute of very uncertain interpretation. As for monopoly, America cannot achieve monopoly while England, France, and other countries are selling in the same market, no matter if the American manufacturers are all combined. And does Mr. Vedder forget the fact that before the war for lack, among other things, of a Webb-Pomerene bill, the copper market was controlled outside instead of in the country?

Letters to the Editor

Wages in the Signal Department

WEST-OF-THE-MISSISSIPPI.

TO THE EDITOR:

How is it that in some departments of the service very good railroads pay very poor wages? I have worked for several railroads in the West and at present am working for one of the best lines in the Pacific Northwest; it is a road with the best co-operation between officers and employees that I have seen anywhere; it has better cars and locomotives, better safety efforts, better harmony between the railroad and its patrons, and good conditions all around. I have boasted about the road and its service; have got some good men to come here from other roads, and I have now and then promoted the business of the company by getting a passenger to take a long trip over its lines. Nevertheless I do not get enough pay. The increases which have been granted, and which are so thoroughly enjoyed by most everybody else in the service have not hit the signal department to amount to anything. A year ago last spring I received, as maintainer, $92.50 a month, with 10 per cent bonus. About a year ago I was appointed acting signal inspector at $110, with 10 per cent bonus. Now I get but little more than a maintainer. They receive $123.25, while I receive $146. There is some talk of an increase, but I cannot find anybody who will tell me what it is to be, or anything definite.

Among the powers that be there seem to be none who appreciate the difference between an inspector and a maintainer. The maintainers live in small towns where expenses are not so high as in cities. Some of them even live in dwellings made from old box cars, furnished by the company. In these small places a maintainer can go out after working hours and get in his wood, old ties and old building material being plenty; and in the timber country logs are exceedingly cheap. The maintainer who prefers to buy his fuel, instead of wielding the axe after hours, can usually buy from the farmers at $1.50 to $1.75 per rick; but I, living in a city, have to pay $10 a cord for four-foot wood and $11.50 a ton for coal. A five-room house fit for a decent family to live in costs $22.50 a month. I have to have a telephone, which costs $2.50 a month on a two-party line. The high prices of food are already familiar to you and I need not make the comparisons; but it is proper to remark that, even when working, I have to wear presentable clothes and shoes, a point which is not important with many employees who get much higher pay, proportionately, than I do. My wife is a marvel of economy, while at the same time she maintains a neat house and presents a reasonably stylish appearance. I have to forego some things which I really need, but I cannot lay this condition to my wife. This winter she is wearing for the third winter a plush coat, fur trimmed, that cost us $45.

I do not object to the payment of high wages to the maintainers, but I do think that the inspector should at least be allowed enough to take care of the unavoidable extra expenses incident to his position. From the employer's viewpoint it is no more than fair to say that he ought to take into consideration the extra effort which a careful and conscientious inspector ought to be expected to put into his work.

Sometimes I am tempted to listen to the fellows who are all the time saying, "Get into something else." Speaking generally, it seems to me that the signal department employees do not enjoy as good treatment as those in other departments. There seems to be an impression among some officers that anybody can be a signal man. A railroad officer was mentioned to me lately by name—I do not know him—who said that he could go around with a maintainer for two weeks and then would be competent to take up his work. Any man who knows the conditions would say that this officer would be absolutely unsafe with that limited experience; he could not even learn to take proper care of the lamps of the semaphores in several times two weeks. In the winter the running and repair of a maintainer's motor car is a job that no green man can take up. I have run a motor car over my territory for four summers and five winters without accident; but I am free to confess that to do this implies a good deal of care as well as experience.

The maintainers in this territory are a conscientious lot of workers. They have to hop onto their gas car at any time, day or night, regardless of the weather, and chase trouble—many times trouble which is not really chargeable to their department. I have had charge of twenty of these men now for about a year; have assisted the officers at investigations. have helped clear up wrecks, and have attended safety committee meetings, where I found officers who, with regard to a great many questions, lacked many kinds of information. I spent three years as a locomotive fireman and thereby acquired, I believe, many points which the signalman coming from outside does not understand.

And when payday comes around and I get my pay and deduct the necessary expenses I have less money to put in the bank than does the maintainer.

PETE BOGG.

The Railroad Question

CHICAGO.

TO THE EDITOR:

The main thing is to have transportation furnished. Without question, transportation, next to the monetary system, is the most important facility that is in civilization.

Before rail transportation was well developed, people could only live in communities along the edge of water. Rail transportation has developed the interior of whole continents, resulting in millions of people being able to carry on their activities and develop their resources wherever they might be. Cheap and plentiful rail transportation has resulted in these people being able greatly to extend their markets and enlarge their activities.

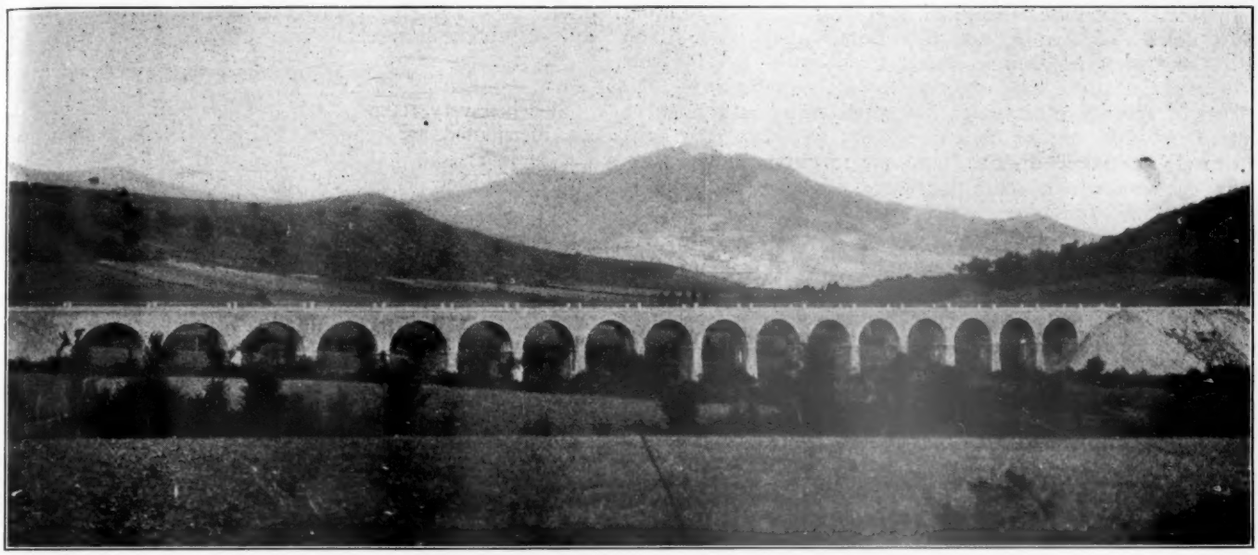
Without a constant growth in railroad facilities, and a constant increase in their efficiency, the life of all the people is seriously affected. It may be that there is a way to keep an activity of this kind in advance better than with the constant spur that rivalry and profit provides, but no such a better way has been brought out yet. No human activity of a large kind has so far been carried forward strongly without the spur of rivalry and profit, and there is no rivalry in the operation of all the railroads in a country as one unit.

This reasoning and this conclusion are either correct or incorrect. If they are correct, then the rivalry should be extended as far as practicable to the point where it will not produce destructive effects on those involved. There is no good thing but that can be carried to the extremes that result in death.

If the reasoning is incorrect, then all the railroads should be operated together by one man, and some means presumably will have to be found eventually to have some control over him. If there is to be a proper and healthful rivalry, it should be carried on with organisms that exist, and any radical changes in such organisms should not be made. They could only result in loss to the people.

An immense number of theories are being indulged in now, as to what should be done with this most vital of our material activities. It is not something to be experimented with. The life of the nation depends upon it. Surgical operations at the present time to remodel this body are not needed simply because it is stretched on the operating table at the mercy of those who have knives and somebody has not been well pleased with the appearance of the body in the past.

F. H. R.



Masonry Viaduct on One of the Spanish Lines

An Important Development in the Railways of Spain

With an Account of a Project for a Proposed New Trunk Line from France to the Straits of Gibraltar

By F. Lavis *

IN THREE PARTS: PART I.—GENERAL DESCRIPTION.

FOR MANY YEARS the project has been talked of for a trunk line from France through Spain, with a connection by car ferry or otherwise across the Straits of Gibraltar to Africa and thence through Morocco to Dakar, from whence a short ocean trip would enable connection to

Fig. 1—Masonry Viaduct

be made with Pernambuco, in Brazil, and from that city eventually, through railroad connections, with all points in Brazil, the Argentine and Chile—in fact to all South America.

This ambitious project is hardly likely to be realized in the immediate future, but the northern section of the line from Madrid to the French frontier was studied by the writer a year or so ago and some account of this is given farther on. In connection with these studies, data in regard to the existing railways and the country generally were obtained, and these with some account of the topography and the industrial development of Spain will be briefly touched on to give some idea of the general railway situation.

Fig. 2—Masonry Retaining Wall and Culvert at Jaca on the Line to Canfranc

Topography

Generally speaking, the interior of Spain is an elevated plateau, about 1,500 to 2,000 feet above sea level, crossed

*Consulting engineer, 120 Broadway, New York City. This article has been prepared by Mr. Lavis at our request, and is a résumé of a report by him, printed in Spanish, entitled "El Ferrocarril Directo, de Madrid a la frontera de Francia," which was specially prepared for the king of Spain, for members of the Spanish government and for private circulation.—EDITOR.

by several mountain ranges and deep river valleys, presenting an accidented terrain, not very densely populated. The transportation problem is, therefore, difficult and the cost of transportation high, by reason of the necessarily high cost of railway construction compared with the volume of traffic. Most of the important cities of Spain, the most densely populated districts, and the manufacturing centers are on or near the coast, so that distribution by water is natural and convenient; hence there has been little if any gradients and small capacity cars and locomotives, were absolutely unable to meet the emergency.

Industries

Sketched very roughly, the principal industries of Spain are distributed as follows: Manufacturing of textiles in Catalonia around Barcelona, and iron and steel along the north coast near Bilbao. Mining of coal and iron principally in the north, near Bilbao, Santander and Gijon, and iron all

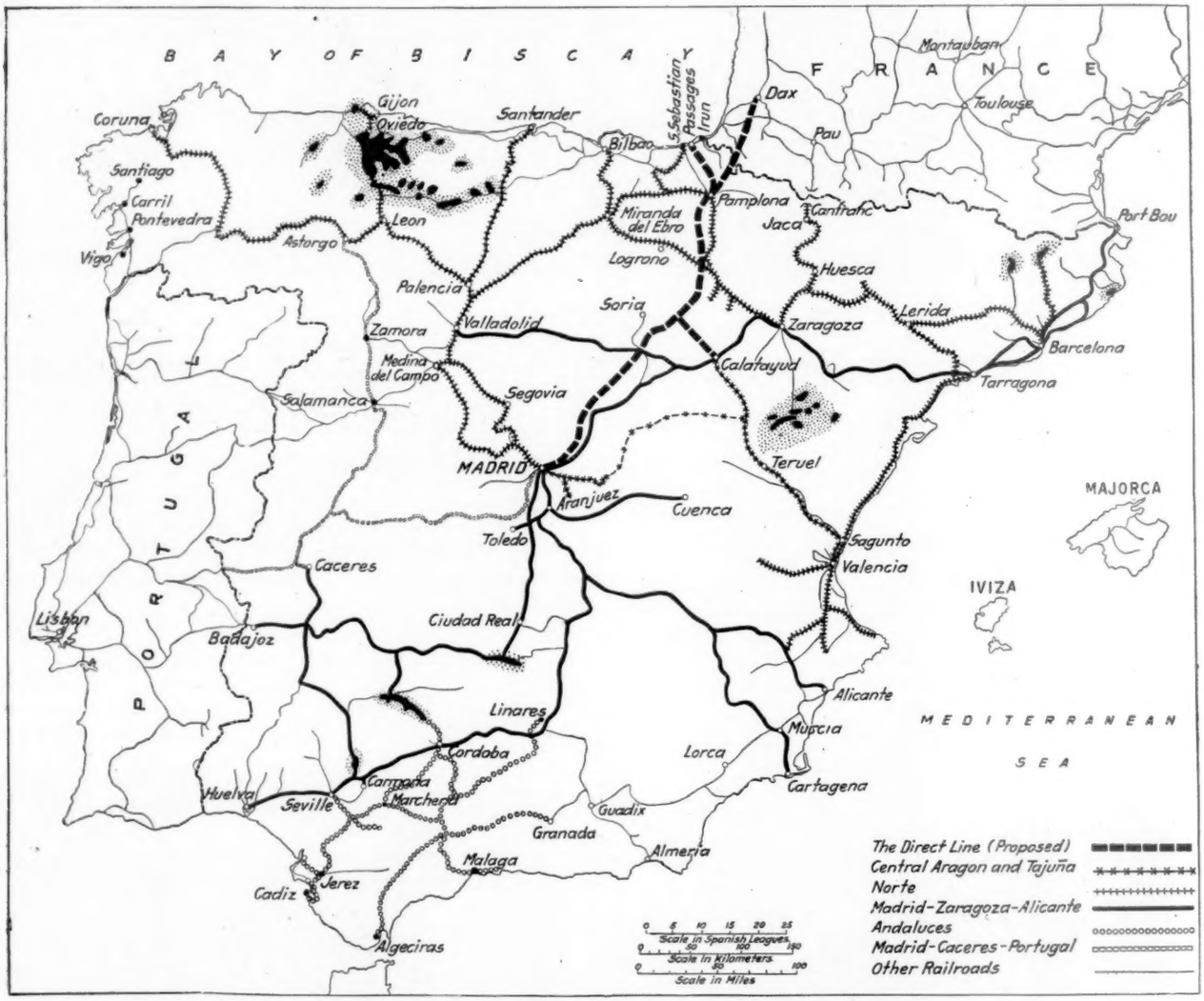


Fig. 3—General Map of Spain Showing Railways and Coal Areas

need for lines adapted to heavy freight traffic. It will be remembered that Spain is almost entirely surrounded by water and has a coast line with many good harbors.

Coal Supplies

These features have a considerable bearing on one important item of transportation, namely, coal. Spain has many mines of coal of good quality but it is, or was with some few exceptions, before the war, as cheap or cheaper to bring coal from England to the coast towns than to mine it in Spain and transport it by rail. Of a total consumption of about 7,000,000 tons per annum, about 2,500,000 were imported from England. The Spanish coal was largely distributed by sea, and when the effect of the war on shipping was realized, the railroads, with their heavy

along the south coast to a smaller extent. Large mines of copper, iron pyrites, and quicksilver in the southwest, around Seville. Fruits and vegetables on the east coast in the vicinity of Valencia, and wines in many parts.

Wine to the value of $12,000,000 to $15,000,000 is exported annually to France; Valencia, among other things, exported in 1912: onions, 140,000 tons (16,000 tons to the United States); oranges 87,000 tons, etc., besides olives, olive oil, almonds and other nuts. The values of the principal minerals exported from Spain in 1915 were, roughly:

Iron ore	$12,000,000
Iron pyrites	7,000,000
Iron metallic	8,000,000
Copper	9,000,000
Lead	13,000,000
Mercury	1,500,000
Silver	500,000

Generally speaking, Spain is not a manufacturing country, and probably manufacturing will not play a large part in the development of the country in the near future. Agriculturally, Spain produces wines and fruits for export; could, but does not quite, produce enough cereals for its own use; has a large and only partially developed mineral wealth.

The country has recovered rapidly under the enlightened and progressive guidance of the present king, Alphonse XIII, and since the war with America relieved her of the drain of both men and money in her colonies. The following

Fig. 4—A Station on the Central Aragon—Typical of the Ordinary Station for Small Towns

figures show its progress previously to the war, and since 1914 Spain has materially benefited from the high prices received for her mineral products, which have been vitally necessary to the Allies. The values of the imports and exports before the war were as follows:

	Imports	Exports
1903	$195,200,000	$189,200,000
1913	283,000,000	239,000,000

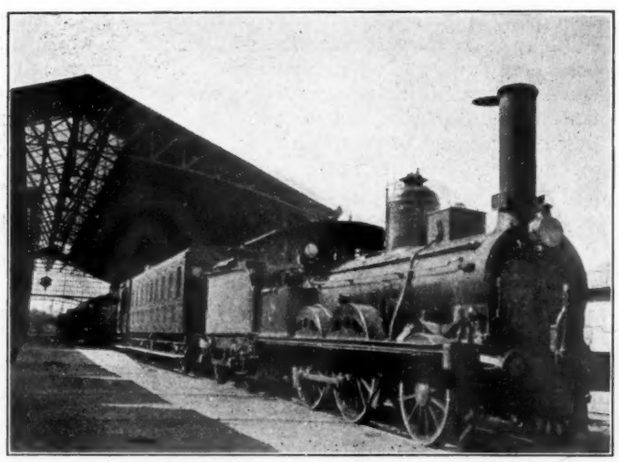


Fig. 5—Passenger Train Leaving Cadiz on the Andaluces Railway

During the war the imports of gold and silver bullion and coin to even up the trade balances have been as follows:

1915	$41,000,000
1916	65,000,000
1917	117,800,000
	$223,800,000

Spain, therefore, finds herself, at the end of the war, over $200,000,000 richer in actual cash, richer still in credits and with no burden of a large war debt. With the continuance in power of a steady and progressive government, which now seems reasonably well assured, Spain today seems likely to be well along the road to resume her place among the important nations of Europe before many decades.

The population of Spain was about 20,000,000 in 1910, and the principal cities are as follows:

	Population 1910		Population 1910
Madrid	599,807	Valladolid	71,066
Barcelona	587,411	Palma de Mallorca	67,544
Valencia	233,348	Cadiz	67,174
Seville	158,287	Cordova	66,831
Malaga	136,365	Santander	65,046
Murcia	125,027	Alicante	55,300
Zaragoza	111,704	Oviedo	53,269
Vizcaya	93,536	San Sebastian	49,008
Granada	80,511	Almeria	48,407

The Railways

During the latter part of 1917 the railway transportation system practically collapsed under the added burden of the

Fig. 6—Freight Train on the Madrid, Zaragoza & Alicante

distribution of coal, made necessary on account of the interruption of maritime traffic, and there was a general demand for more railways, double tracks, more rolling stock, etc. It was known that the commerce of Spain had increased 50 per cent or more during the preceding ten years, and the railway mileage less than 5 per cent during that period, and this was considered to be all that was necessary to show the need of new lines and more tracks on the old ones; interest was also revived in the proposed "Direct" line to France.

It may be worth noting in this connection that European engineers do not seem to give that consideration and study which American engineers and traffic men do, to the possibilities of increasing the capacity of railways by introducing heavier or different motive power, or the better utilization of

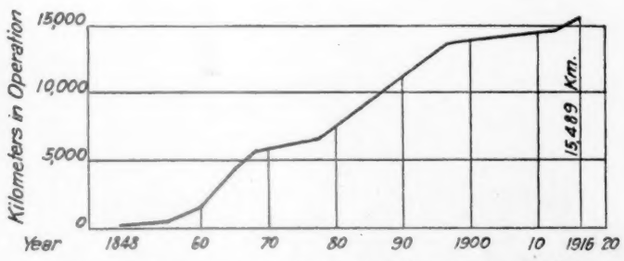


Fig. 7—Progress of Railway Construction in Spain

rolling stock, and double tracking is advocated long before the single track lines attain the capacity which many single track lines have in the United States.

The progress of railway construction in Spain is shown by the diagram in Fig. 7.

Besides the fact that railway development in Spain has not kept pace with the really considerable commercial development, it is to be noted also that it is less than that of any country of importance in the world on the basis of population and area, as is shown by the following table:

COMPARISON OF RAILWAY MILEAGE OF VARIOUS COUNTRIES ON BASIS OF AREA AND POPULATION

Country	Per 1,000 square kilometres	Kilometres of railway per 10,000 population
Belgium	298	12.3
France	120	16.8
Great Britain	119	9.6
Germany	118	12.2
Switzerland	117	16.3
Holland	99	6.9
Denmark	96	16.3
Austria-Hungary	69	10.3
Italy	62	5.6
Portugal	34	5.8
Sweden	32	29.5
Spain	30	8.6
United States	45	59.4
Canada	5	92.4
Mexico	13	20.6
Argentine	11	71.1
Brazil	3	15.3
Chile	8	16.9

There are several reasons for this lack of railway development in Spain besides the generally accepted, off-hand one,

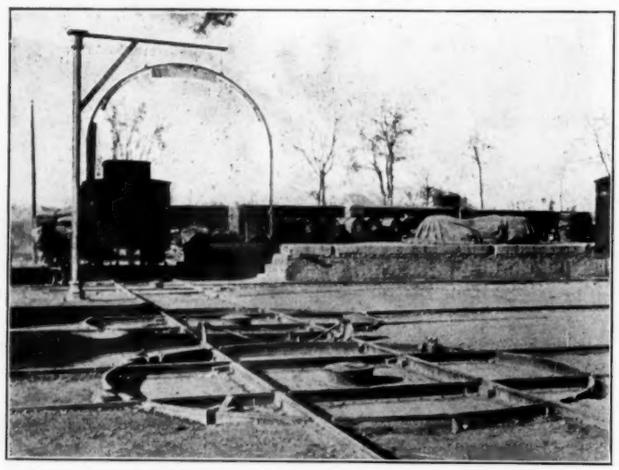


Fig. 8—Transfer Tables for Shifting Freight Cars at Stations

that Spain is one of the most backward countries in Europe in matters of modern commercial development. This was, to some extent, true up to the end of the 19th century, but since then there has been an awakening and a very considerable increase in commercial activity and a general development along certain lines as has been indicated above.

The two most important of these reasons for the backwardness of railway development, are the difficulties of the topography in the interior, making construction difficult and expensive, and the character of the commercial development. This latter has been largely along the coast where water transportation is available, thus making the need of interior lines of communication less necessary in Spain than in many other countries.

A third reason has been an apparent lack of appreciation on the part of the government of the economic principles governing the construction and operation of railways, which

Fig. 9—Water Tank and Water Softening Apparatus

has resulted in the construction of unnecessarily expensive lines, even for the somewhat difficult country in which they have been built, and especially, in view of the comparatively small volume of traffic, many of them are called upon to handle, and expensive in ways which do not result in corresponding efficiency of operation.

The first railways in Spain were of 5 ft. 6 in. gage and this and the type of rolling stock used, caused regulations to be adopted limiting the curvature, and requiring stone ballast and certain expensive types of structures which considerably increased the cost without adequate, compensating advantages. This caused the usual reaction to a narrower

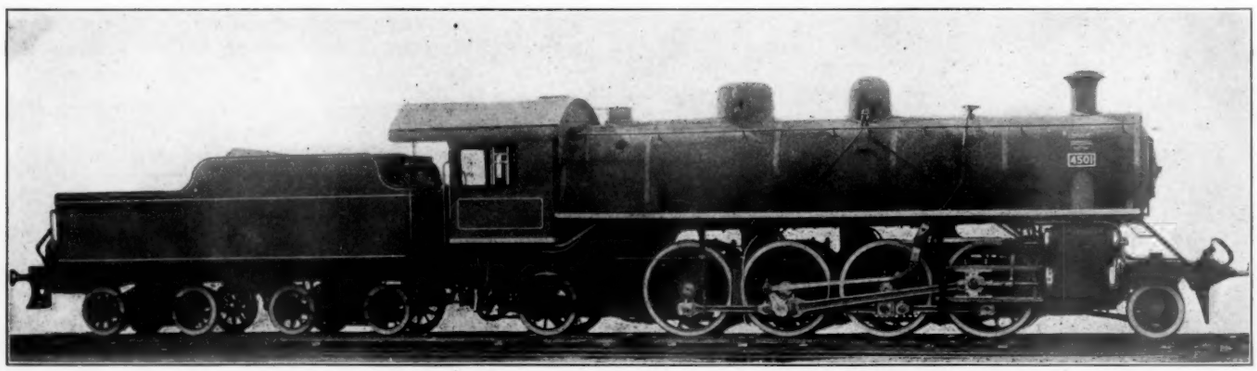


Fig. 10—One of the Locomotives Recently Built by the American Locomotive Company for the Northern Railway

gage * to decrease the cost, and although the first cost of these narrow gage lines has been decreased by the use of sharp curvature and steep gradients, these have so increased the cost of operation that the resulting ton mile cost is as great or even greater than on the lines of wider gage. There is also the great disadvantage of not only two different gages, but also that of two gages, both different from the general European standard (4 ft.-8½ in.).

The realization of the difficulties of this situation and the desire for a more intelligent appreciation of the economic relation between first cost and cost of operation, have led to

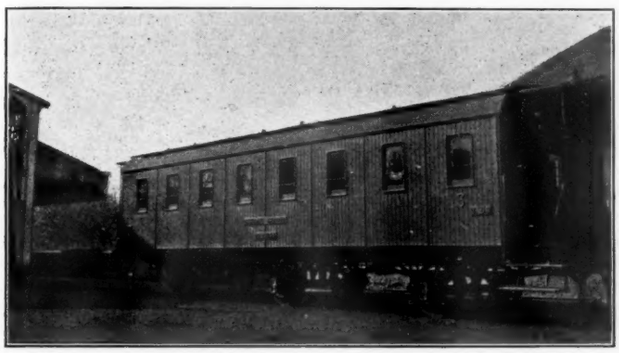


Fig. 12—Passenger Coach on the Central Aragon

the proposal by certain engineers and others for the adoption of the European gage and the desire for the introduction of American methods of design and operation for the railways of Spain.

Generally speaking, the track is well built, the better lines—of fairly heavy traffic—with rails of 80 to 90 lb., using screw spikes and tie plates on untreated oak ties. Ties are of about the same dimensions as ours, but usually a little thinner and with wider face. They are quite expensive and so fewer are used. The rolling stock is much lighter than ours, but the usually heavier rail compensates for the fewer ties (1,500-1,800 per mile). Stone ballast is used almost invariably. The bridges, stations and structures are generally of stone masonry, which costs very little. (See Figs. 1, 2 and 4.) Where steel bridges are used they are usually designed for lighter loadings, (E35 to E40 about), than is customary in the United States.

Photographs of typical passenger and freight train equipment are shown in Figs. 5, 6 and 8. The freight cars, as will be noted, are of the usual European type of 10 to 15 tons capacity. Some of the passenger trains have fairly modern cars with bogie trucks, but many are of the rigid 3 axle type. The transfer tables shown in Fig. 8 are used for shifting the cars from one track to another in the station yards. Fig. 5 shows an "express" train ready to pull out of the station at Cadiz on the Andalusian Railway, but Figs. 10 and 11 show the modern American locomotives built for the Norte and M. Z. A. during the last 3 or 4 years, their principal dimensions being as follows:

	Norte	M. Z. A.
Engine weight in working order tons metric	87.5	85.3
Tender weight in working order tons metric	55.8	46.7
Driving wheel base, milimetres	57.00	49.50
Cylinders hp. diam., milimetres	4.20	5.84
Cylinders l.p. diam., milimetres	6.40	...
Cylinders stroke diam., milimetres	6.50	6.40
Tractive power, kg	161.00	150.60

The two most important systems are those of the "Norte" (Compania de Caminos de Hierro del Norte) and the M. Z. A. or Mediodia (Compania de los Ferrocarriles de Madrid á Zaragoza y á Alicante).

The Norte covers practically the whole of the territory to the north and west of Madrid, and has also an important line running from Miranda down the valley of the Ebro to Zaragoza and from there, by a line through Huesca to Jaca and Canfranc, where connection will eventually be made to France by the Somport tunnel, a line through Lerida to Barcelona, and another line from this latter city to Tarragona and from there all along the coast to Valencia.

The M. Z. A. has a main line from Madrid to Barcelona, with a line to the west from Ariza to Valladolid through the valley of the Duero, towards the southeast a line from Madrid to Valencia, Alicante and Cartagena, and towards the south the main line to Linares, Cordoba and Seville and another to Ciudad Real and Badajoz for Portugal.

These two systems, therefore, cover practically the whole of Spain except the extreme south, in which the Ferrocarriles Andaluces, a comparatively small system, operates. Both were originally quite largely developed by French capital—the Norte through the Periers and the M. Z. A. through the Rothschilds, but since the war, control is said to have been obtained by Spanish interests.

The Northern Railroad

The lines of the Norte, which are of most interest in connection with the study of the "Direct" line to France, are: the main line from Madrid to Irun and the branches from this to Bilbao, Santander and Gijon (Oviedo).

Leaving Madrid, (elevation 2,000 ft.), the main line of the Norte runs directly towards the west and almost immediately crosses the Guadarama Mountains by two lines, which unite at Medina del Campo. These crossings are at elevations of approximately 1,350 meters (4,460 ft.). This mountain barrier which separates the "Plains of Old Castile" from Madrid and all the east and south of Spain, must be

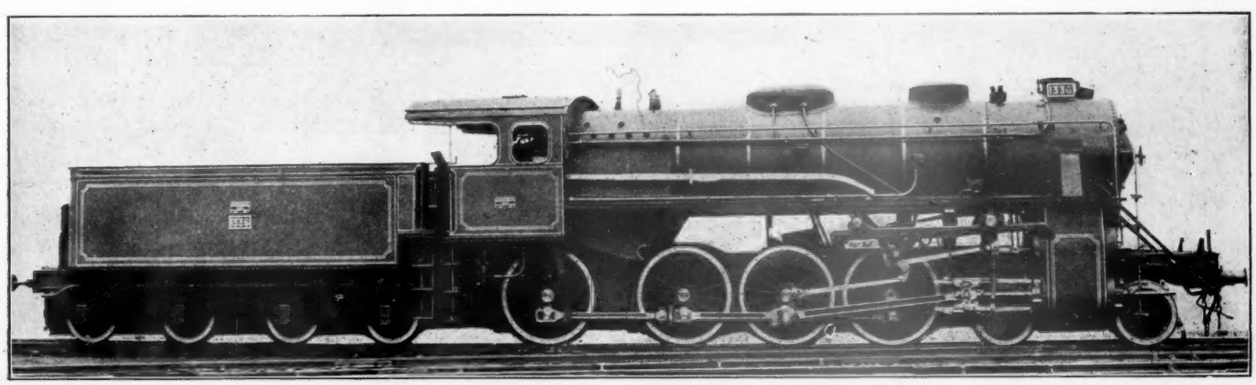


Fig. 11—One of the American Locomotive Company's Engines Built for the Madrid, Zaragoza & Alicante

*There are now 4,000 kilometres (2,480 miles) of metre gage out of a total of 15,500 kilometers (9,610 miles) of railway, the rest being all 5 feet 6 inches.

kept in mind in comparing the route of the Norte with that of the "Direct" line.

From Medina del Campo the Norte follows across the plains through Valladolid and Burgos with good alinement and easy work until just before reaching the valley of the Ebro, but from there on to the frontier the work is fairly heavy.

Fig. 13—In the Cantabrian Mountains Between Pamplona and San Sebastian

The plains of Old Castile are separated from the North Coast of Spain by the Cantabrian Mountains, which are a continuation of the Pyrenees. Both ranges are generally much steeper and the elevation to be overcome greater on their northern sides, on account of the elevation of the Central Plateau on the south. This is shown by the comparative profiles, Fig. 15, of the four lines of the Norte across the mountains to the coast, and for convenient reference the heights of the passes are given in feet as well as in meters in the following table:

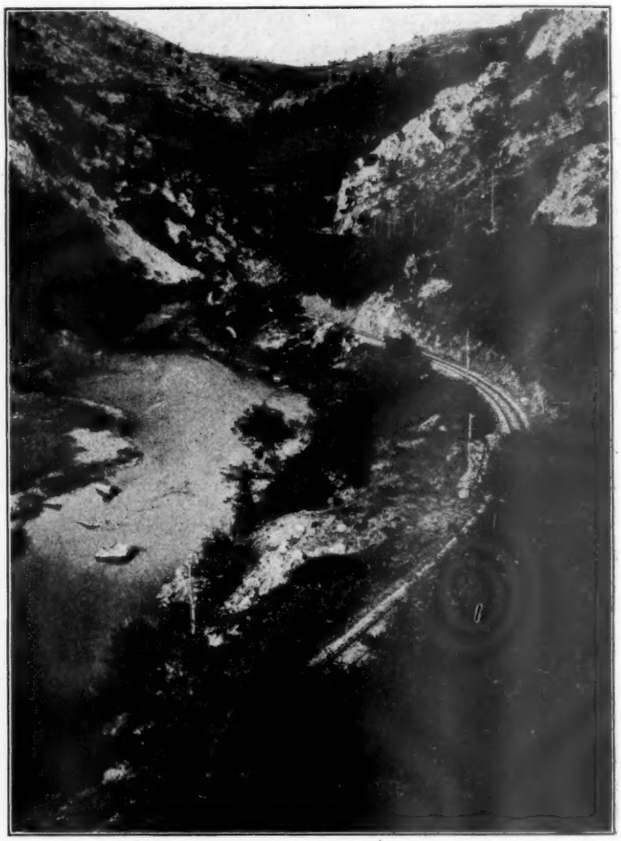
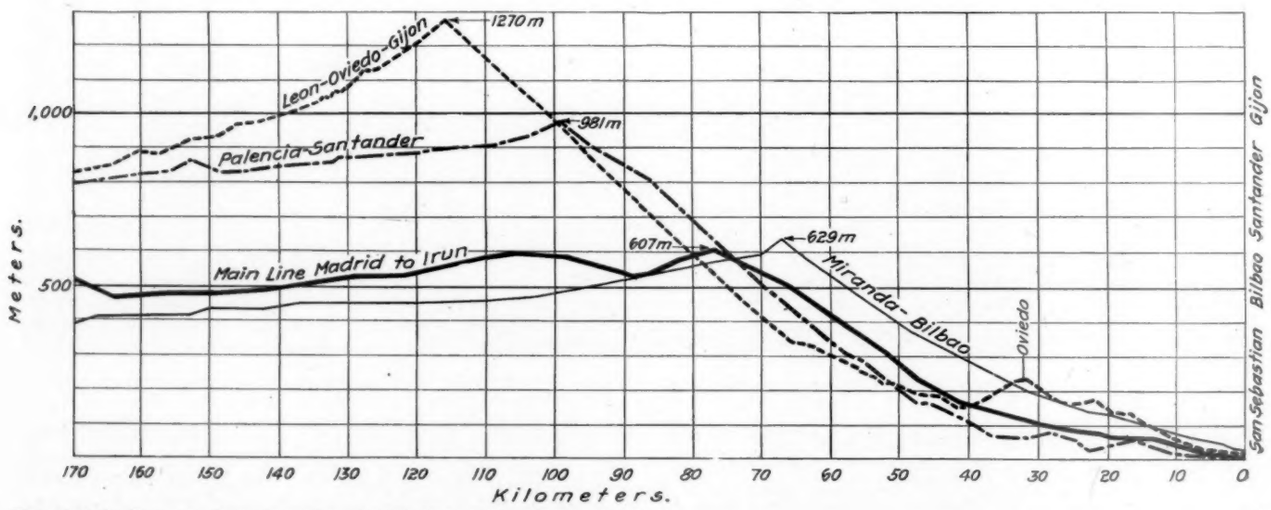


Fig. 14—Another View on the Line Between Pamplona and San Sebastian

	Metres	Feet
Main line to San Sebastian	607	2,003
Line to Bilbao	629	2,076
Line to Santander	981	3,237
Line to Gijon (Oviedo)	1,172	3,868

Typical scenes showing a line in the Cantabrian Moun-



Note that the lines are shown from the coast inland to points 170 km. distant

Fig. 15—Profiles of the Lines of the Northern Railway Across the Cantabrian Mountains

tains are shown in the photographs in Figs. 13 and 14.

Bilbao is the center of the steel industry of Spain, the blast furnaces and rolling mills being located there. Much iron ore is exported from Santander, and Gijon and Oviedo are the centers of the Asturias coal fields. There is also a large steel plant at Mieres near Oviedo.

The Madrid, Zaragoza & Alicante

The only line of the M. Z. A. which is of much interest in connection with the investigation of the "Direct" line to France is the line between Madrid and Zaragoza, at which latter place connection is made with the line of the Norte to Huesca and Jaca. Beyond Jaca the new line across the Pyrenees through the Somport tunnel is nearing completion and this will open up a new route to France by connections through Pau and Tarbes.

The distance from Madrid to the frontier by this route is, however, some 555 kilometers and the connections on the French side are not very good. The elevation of the Somport tunnel is 1,200 metres (4,000 ft.), and the gradients on the French side are 4 per cent (3.4 per cent in the tunnel). It seems unlikely, therefore, that this route will ever be a serious competitor for through travel and will have only a local benefit. The gage is 5 ft. 6 in. on the Spanish side and 4 ft. 8½ in. in France.

The Somport (Canfranc) tunnel is 8 kilometers long and the frontier is almost in the center of it. The international station at Canfranc is wholly in Spain, and the French are to operate through the tunnel into the international station. Figs. 3 and 4 show some of the masonry structures on this line.

On the main lines of both the Norte and M. Z. A. some first class express trains are operated, with diners and sleepers of the Wagons Lit Co. The Andalusian Rys. are, however, generally speaking, rather poorly equipped and maintained, with light rails and rolling stock adapted only for a light traffic. The daily express leaving Cadiz for Seville is shown in Fig. 5 and is typical of the rolling stock of this system.

A Possible Solution of the Railroad Problem

Weak and Strong Roads Combined End to End So as to Increase Competition and Greatly Strengthen All Railroad Credit

By F. J. Lisman

THIS PLAN IS INTENDED to accomplish the following:

1. Provide for the immediate return of the railroads to the companies on a basis which will protect the companies.
2. Assure the government of a return within a reasonable time of any advances made by it to the railroad companies.
3. Provide for supervision of all railroad securities.
4. Provide for proper railroad regulation.
5. Provide for fair valuation which is just to the public and to the companies.
6. Provide ample competition; in fact, more than previously existing, but will prevent same from being wasteful.
7. Very important, it will put all the railroads immediately on a basis of excellent credit.
8. Stimulate rehabilitation work on part of the railroads and thus stimulate business in general.

To accomplish these results, it is proposed that an act of Congress be passed providing that railroad companies agreeing to consolidate with other railroad companies, in accordance with the instructions of the Interstate Commerce Commission, as explained later, shall receive back their properties and shall receive a federal charter which will protect them against rate regulation of any kind on the part of the states, and which will provide that they shall be entitled to earn 6 per cent on their legitimatized value, when this is ascertained, and, in the meantime, to receive the present standard return.

To arrive at a valuation it is proposed to create a valuation commission, with headquarters at Washington, which can determine on broad principles of valuation to be carried out by regional valuation boards. These regional boards should be composed of representatives of the different interests of their respective sections; that is, farming, labor, etc., and are to determine promptly the "legitimatized value" of properties in their district on a basis of fair, physical value and earning capacity.

The Interstate Commerce Commission's functions should be made largely judicial and six regional commissions should be created, each to be composed of representatives of different interests in the region, and to have a mandate authorizing the railroad companies to fix rates so as to enable them to earn not less than 6 per cent on their legitimatized value. The Interstate Commerce Commission, through a separate bureau on which there should be representatives of the railroad companies, would determine which railroad companies are to be consolidated so as to form from six to twelve national railroad systems.

It is proposed that a new United States Railroad Court of Appeals be created to deal with all litigation under the railroad control law of March 25, 1918, as well as that arising under the new laws.

Consolidation

By consolidating the various railroad companies and merging the weak companies with the strong systems, the credit of all railroad companies as a whole, as well as in detail, is promptly rehabilitated and put on a very sound basis. Practically all railroad securities, especially bonds, will as a sequence become readily marketable. This will help not only with the financing of government loans, but will also greatly help in the rehabilitation of business. The new national railway systems will promptly strengthen the weak part of their properties and will want a large amount of material and labor for that purpose. The public's position will be greatly improved because all communities now located on weak roads will hereafter be on strong roads. The plan provides for competition and creates some new through routes not now existing.

Companies taking out federal charters must consolidate with such other companies in accordance with instructions of a special bureau of the Interstate Commerce Commission. Companies on consolidating shall issue certificates of beneficial interest to the stockholders and junior bondholders of the corporations which join in a consolidation. These holders of certificates of beneficial interest are to be entitled out of earnings to the same payment of interest and dividends which they have received as the standard return under the law of March 25, 1918, and after the necessary valuation of

each property has been completed they are to be entitled to stock in the consolidated company in accordance with the legitimatized value as then determined. To give an example, if the Chicago, Burlington & Quincy, the Great Northern and Erie should be merged, the stockholders of the Great Northern would receive for their stock beneficial certificates of interest and would be entitled to a continuance of 7 per cent dividends out of earnings the same as received hitherto. If their equity as represented by $250,000,000 of Great Northern preferred stock now outstanding should, when valuation is completed, be certified as representing a legitimatized value of $150,000,000, then the Great Northern stockholders would be entitled to 60 per cent in the capital stock of the consolidated corporation. If, on the other hand, the legitimatized value should be $300,000,000, then the stockholders of the Great Northern would become entitled to 120 per cent in the stock of the new company.

Bond issues the interest charges of which require more than 70 per cent of the standard return shall be exchanged for beneficial certificates of interest, so that their status may be changed in case the valuation of the property on which they are a lien shall be found to be insufficient to cover such issue, and also that money spent for rehabilitation of the property may be given priority in lien to such an issue.

The holders of stock of the Erie Railroad, as well as junior bond issues, would also have to exchange their securities for beneficial certificates, and if, after the valuation is completed, it shall be determined that the properties are worth less than the entire bonded debt, then the junior mortgage would receive only its pro rata of stock of the consolidated company. If, on the other hand, the physical value should be in excess of the entire bonded debt, but less than the total amount of capital stock outstanding, then the bonds shall be left undisturbed and the proportion which each class of stock should receive of the new stock shall be left to an arbitration committee which shall be composed as follows: A member of the Interstate Commerce Commission and a representative of each of the different classes of stock involved. If this committee cannot agree on the distribution the matter is to be submitted to the United States railroad court of appeals, the decision of which shall be final.

Any money spent for the rehabilitation of a weak company between the time of the organization of the consolidated company and the final determination of legitimatized value shall be an obligation of the new consolidated company and a lien prior to the junior securities of the weaker company, which will be represented by certificates of beneficial interest. The intent of this is to protect the consolidated company for expenditures for prompt rehabilitation of its weaker parts, so as to encourage it to proceed with this work promptly, thus stimulating industries and assuring better transportation facilities to the public located along the weak lines.

Valuation

The public and Congress still want a physical valuation, as they have the idea that railroads are over-capitalized. Physical valuation will therefore have to go on; but it should be on fair basis. The valuation problem is such an important one that a special board of valuation should be created with headquarters in Washington. The country should be divided into, say, twelve districts, to be in charge of regional boards, which should be selected very much in the manner in which the board of the Federal Reserve bank is selected; that is, each valuation board should consist of, say, seven members, to be selected in the following manner. Each one of the following interests shall submit three names to the president:

1. The wholesale and retail merchants of the region, say, through the chambers of commerce.
2. The manufacturers of the region, say, through the manufacturers' associations.
3. The farmers, say, through farmers' alliances.
4. The banking interests, through the Federal Reserve bank or the bankers' associations.
5. The laboring interests, through the labor unions.
6. The railroads themselves, say, through the presidents of the corporations, voting in proportion to mileage, with the proviso that the roads having 1,000 miles or more should be entitled to cast a vote for not exceeding 1,000 miles.
7. The state railroad commissions within the district.

The president shall nominate one from each of these classes to act as a valuation board. The regional valuation board is to value the companies' properties in each region, taking all factors of cost into consideration. The central valuation board in Washington shall be selected in a similar manner from the country at large. It shall be the function of the central valuation board to lay down rules for the regional valuation boards, pass on doubtful questions, and to see that the valuation boards carry on everywhere the valuation work on the same principles.

The present valuation act of Congress provides that the railroads should be valued on a basis of what it would cost to reproduce same as of July 1, 1914, plus cost of additions since that date. Large sums of money have been expended under this act, and there has been much friction over the valuation of the few properties where this work has been completed.

Under the right of eminent domain the government must pay a fair value for property. A determination of a fair value for railroad property as of July 1, 1914, has no bearing on the fair value of this property at this time. The new valuation work should be entirely separate from the work of the Interstate Commerce Commission, because the commission is, under this proposed plan, to have a mandate permitting the railroad companies to earn fair interest on their value, and, therefore, should not, at the same time also, determine that value. The present officials in charge of the valuation work have construed the law very literally and have, for example, refused to allow the railroads for the cost of cutting down trees because there were no trees on the right of way on July 1, 1914, on the theory that if the road were to be rebuilt on July 1, 1914, no trees would have to be removed. Similarly, there have been cases where a railroad moved a highway from one side of the right of way to the other side in order to avoid two grade crossings of the same highway. The valuation engineers have refused to allow the railroads for the cost of this work because these highway crossings did not exist as of July 1, 1914. In another case a railroad which was being valued had erected a heavy overhead bridge and passed underneath in order to avoid a crossing with an important line. The valuation engineers would not give the credit to the railroad which built this bridge, stating this was part of the property of the other company. Valuations of real estate have in many cases been on a par in intelligence and breadth of view with these decisions. It certainly is not surprising that the companies have objected. No business man would think of valuing properties on this basis.

Final legitimatized valuation should be the mean or average between the developed earning capacity, capitalized at 6 per cent, and the fair physical value; that is to say, that if a company's physical property is determined to be worth $125,000,000, and it is earning 6 per cent interest on $100,000,000, it should be taken over on a basis of $112,500,000. If, on the other hand, it is earning 6 per cent interest on $140,000,000 and its physical valuation is $125,000,000 it should be taken over on a basis of $132,500,000. Companies which have no earning capacity whatsoever shall be taken over at one-half of their physical value, provided the valuation board and the Interstate Commerce Commission deem the property necessary in order to serve the adjacent communities.

Future earning capacity shall also be taken into consideration by the valuation board, provided that no company which

heretofore has failed to earn 6 per cent interest on its cost shall be allowed for earning capacity an amount which would bring its total legitimatized value to a sum in excess of its physical value. If the valuation board should determine that a company has a certain undeveloped earning capacity which it will take ten years to develop, such company should be allowed an increase of one-tenth of this expected development for each year for ten years. For example, if a property has a physical valuation of $10,000,000, and its standard return should be $400,000, and if it should be determined it has an undeveloped earning capacity of $100,000 additional, the company should be entitled to issue securities as follows:

$400,000 capitalized at 6 per cent would be a valuation of	$6 666,600
Average of earning and physical value	8,333,333
Interest on this amount at 6 per cent	500,000

If the valuation board should find that the company has strong probabilities of developing its business sufficiently to develop a net earning capacity in excess of $500,000, say, up to $580,000, then this $80,000 expected increase in earnings might be represented by an additional stock issue of $1,333,000, which shall be issuable to the stockholders of the existing company at the rate of $133,000 per annum.

Differences of opinion as to valuation between companies and valuation boards shall be submitted to an arbitration committee, consisting of two railroad officials, two members of the regional valuation board, and a United States district judge. Either side, however, should have the right of appealing from this arbitration committee to the central valuation board, and also to the railroad court.

The valuation board shall go out of existence as soon as the work of valuing and appraising the various railroad properties is completed.

Regulation

The function of the regional interstate commerce commissions shall be as follows:

To approve of capital expenditures and of all future security issues.
To regulate competition between the railroad systems, preventing an excess of competition but at the same time securing ample competition in service and facilities.
Pooling among the systems shall be permitted, but any pooling agreement must be subject to the approval of the regional interstate commerce commission.
Appoint arbitrators whenever questions arise between the railroad companies; for instance as to the rental payable by railroad companies for terminal facilities belonging to each other and to terminal companies, or for trackage rights which railroads may rent from each other; divisions of rates, etc.
Listen to and pass on appeals of rates whenever arbitration committees, hereinafter mentioned, cannot agree on rates.
They shall have a mandate in accordance with which the general rate structure must provide a revenue which will be sufficient to enable the companies to earn the standard return, and after valuation is completed not less than 6 per cent interest on the legitimatized value, plus a reasonable amount to take care of depreciation and obsolescence.
Arrange the settlement of questions arising between the railroad companies and state authorities.
Deal with other problems as same may arise from time to time.

The function of the Interstate Commerce Commission in Washington shall be:

To pass on appeals from the rulings of the Regional Commissions.
Pass on questions arising between the state commissions and the regional commissions.
Pass on all questions where more than one region is involved.
Lay down general rules so that all regional commissions will deal with their problems in a similar manner.

The special bureau of the Interstate Commerce Commission which is to determine which railroad companies are to consolidate with each other is to be composed of seven members, of which three shall be appointees or members of the Interstate Commerce Commission, three shall be appointees of the railroad companies, and the seventh member shall be from time to time selected by the other six, or be nominated by the United States railroad court of appeals.

Other Provisions

A United States railroad court of appeal does not need any elaboration. It might be pointed out, however, that the court of claims will rapidly become clogged with suits arising out of the war, and the new court would, on the other hand, soon familiarize itself with railroad matters.

Each railroad company should have nine directors, of which five should be nominated by the stockholders and two by the government and two by the employees of the railroad companies, the same as in the case of the regional valuation board and commerce boards.

The five directors representing the stockholders shall select two each of these classes from the six names suggested to be directors to represent the government and the employees. Any director representing the employees must have been a railroad employee continuously for at least ten years, except for absence on account of the war or ill health, and an employee of the company for which he is to be a director for at least five years.

Each director shall be entitled to an annual salary of $2,000 as long as the company pays only the minimum dividends guaranteed by the government, and shall be entitled to $1,000 additional salary for every ¼ per cent increase in dividend which the company may disburse to stockholders.

Provisions should be made under which the companies must keep separate accounts of all earnings and expenses in each region.

Provisions should also be made for the joint use of terminals of all the systems under the regulation of the regional and federal commerce commissions. Independent terminal companies in each of the various cities should be consolidated and the interest on their bonds and dividends on their stocks, according to the proper valuation, shall be paid pro rata by the various railroad companies, according to their use. For instance, in the Chicago district there might be a consolidation of the Chicago terminals of the Chicago & Western Indiana, the Chicago Junction Railway, the terminal property of the Baltimore & Ohio, and some of the other lines and included therein might also be some of the outer belt lines, like the Chicago, Milwaukee & Gary, and the Elgin, Joliet & Eastern.

In congested cities like Cincinnati and Pittsburgh the construction of a proper belt line should be promptly taken up, existing lines to be used as far as possible.

Disputes as to the fairness of rates should be submitted to arbitration. Parties interested in rate reduction should select from their line of business two men to represent them, the railroad companies to select two men, who shall endeavor to settle the matter. If they are unable to do so they shall select as a fifth man some member of the regional commerce commission and if they fail to agree on some man the United States district judge shall select a fifth man.

Any decision of such an arbitration committee, however, may be appealable to the regional commerce commission, to the federal commerce commission in Washington and to the railroad court of appeals.

Labor disputes as to wages should be settled in a similar manner.

A pension system for all employees is to be established at once and is to go into full effect within five years; the cost of this system to be fairly prorated between the companies and the employees.

Net earnings above 6 per cent on the legitimatized value, after allowing a proper amount for non-productive improvements or obsolescence, to be used as follows:

One per cent per annum may be set aside in a reserve fund to meet any deficiency below 6 per cent during any subsequent year; any surplus above that to be divided to the extent of one-third to the company, one-third to the employees and one-third to the government.

After a surplus fund of 5 per cent has been accumulated, all earnings above 6 per cent are to be divided on the basis of one-third each to the company, the government and the employees.

If the earnings in any one region have averaged above 7 per cent for two years in succession, but not before then, the regional commission may at its option take up the matter

of rate reduction so as to reduce the average incomes of the companies to 6 per cent.

On the other hand, if the average return of the companies should fall below 6 per cent for two years in succession the railroads may at their own initiative advance rates. If the income should fall below 5 per cent in any one year the companies need not wait two years, but may advance rates after the expiration of one year, so as to be sure of an income of 6 per cent.

(To Be Concluded Next Week.)

Orders of Regional Directors

CHINESE ALIEN PASSENGERS.—File 60-1-12 of the Northwestern regional director similar to file 1600-115A599, of the Eastern Regional director, abstract of which was published in the *Railway Age* of March 21 (page 759). The Southwestern regional director, in Order 180, has issued similar instructions.

Standing Orders from Consignees.—Order 177 of the Southwestern regional director similar to file 5600-19-A600 of the Eastern regional director, abstract of which was published in the *Railway Age* of March 21, (page 758).

Regulations for the Movement of Cotton.—Order 182 of the Southwestern regional director cancelling Order 82 and supplements, gives instructions for the handling of cotton to avoid accumulation at compresses and to secure proper loading of cars.

Issuance of Passes to Non-Government Roads.—Supplement 15 to Order 109 of the Southwestern regional director, quotes a letter from W. T. Tyler, director of the Division of Operation, to the regional directors, abstracted in the *Railway Age* of March 14 (page 602), and adds that it is the intention of the latter order that independently operated railroads shall obtain trip transportation over other than their own connection in accordance with past practice.

Classification of Material.—Northwestern Regional Purchasing Committee Circular 66 contains the material classification which has been adopted for use on roads under federal control. Roads which now use a classified form of accounting for material should substitute this classification for the work now in use before taking the next material inventory. There is in course of preparation a standard form of monthly classified stock report or balance sheet for use in connection with this classification of material, which can be supplied railroads to serve as a guide in the making of monthly stock reports.

Intensive Loading of Fertilizer and Agricultural Lime.—Circular 192 of the Southwestern regional director cancels a letter of February 17, similar to Supplement 1 of Circular 67 of the Northwestern regional director, abstract of which was published in the *Railway Age* of February 28 (page 486), relative to securing a copy of the bill-of-lading covering fertilizer and agricultural lime shipments from manufacturers to be forwarded by railroad agents to the Car Service Section. Where it is not possible to secure an extra copy of the bill-of-lading from the shipper, the railroad agent should forward direct to the Car Service Section at Washington on the 7th, 14th and 21st and last day of each month, beginning March 21, either a copy of the way-bill, bill-of-lading or abstract giving the following information covering every carload shipment of fertilizer and agricultural lime when not loaded to the minimum of 60,000 lb.; date, car initial, number of consignor, consignee, destination, contents, weight and car capacity.

Loading and Unloading of Tank Cars.—Order 181 cancelling Order 123 of the Southwestern regional director states that instructions regarding switching service Sundays, holidays and Saturday afternoons for loading and unloading tank cars is canceled. The Oil Division of the Fuel Administration advises necessity for this service no longer exists.

Cotton Embargo.—Order S. D. No. 21 of the Southern regional director, which cancels Order S. D. No. 14, provides that hereafter, cotton (except when moving under transportation orders of the War Department), from points west of Chattanooga, Birmingham, Montgomery and Pensacola, destined to Jacksonville, Fla., Brunswick, Ga., Savannah, Ga., Charleston, S. C., and Wilmington, N. C., proper, or for export through these ports, will not be moved except under permits from the Southern Export Committee.

Handling of Automobile Cars.—In Circular Letter No. 430, the Southern regional director calls attention to the universal scarcity of freight cars for automobiles. Special care must be taken on each railroad to conserve the use of automobile cars for the purpose for which they were built, and to get them into the territory where most needed. In loading these cars in their return movement care must be observed to permit loading only when it will serve the purpose of expediting the return movement of the car to automobile loading points. If any question exists as to the territory to which empty cars should be forwarded, information should be requested of the regional director.

Return of Cars to Non-Federal and Canadian Roads.—The Northwestern regional director in Freight Car Distribution Notice 7 cancelling Freight Car Distribution Notice 3, augments the later notice, abstract of which was published in the *Railway Age* of February 28 (page 486) by stating that under an arrangement between the Canadian War Board and the Car Service Section, Canadian roads will accept the home delivery of any Canadian owned freight car of any kind at any junction point, regardless of home route. And in a similar manner, railroads under Federal control will accept from Canadian roads at any junction point any cars belonging in the United States or Mexico, including both federal controlled and non-federal controlled cars. Cars so received belonging to non-federal or Mexican roads will be moved home in accordance with the above instructions.

From the Louisville Courier-Journal

The Railroader—"Never Again"

Pocahontas Region—Study of Operating Conditions

Converted a Condition of the Acute Coal Famine Into a Condition of Ample Reserves and Growing Surplus

THERE WERE FOUR immediate tasks that were undertaken by the roads now in the Pocahontas region when war was declared. New England was in direst need of coal, and this need was becoming more unendurable every day; materials and supplies had to be brought to Hampton Roads for the construction of the great naval base established there; troops had to be moved to Norfolk, Va., the port of embarkation next in importance to New York, and materials and supplies brought for an embarkation camp; and the United States Navy in home waters had to be coaled.

When the Pocahontas region was created it was felt both in New England and at Washington that if New England could be furnished with a sufficiency of coal by January, 1919, the situation would be saved, but there was a hope only for such a happy ending. By October, New England had plenty of coal, and was full up with coal by January.

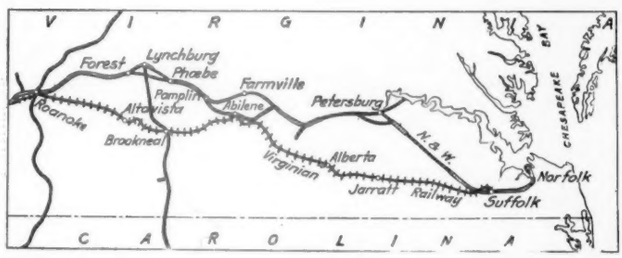
The Naval Base at Sewalls point on Hampton roads was constructed to have a capacity of 20,000 sailors, this being on the site of the old Jamestown exposition, and afterwards the government authorized an extension to a capacity of 30,000 sailors. The work being done there by the government, making this a permanent naval base, required a large amount of construction material. Permanent tracks have been laid into it, connected with the Virginian and the Norfolk & Portsmouth Belt Line. A large quartermaster's terminal on Hampton roads waterfront, with large and well equipped warehouses, docks, and open piers, has also been constructed, with classification yards inside and a classification yard outside into which the railroads delivered the construction material for the piers and warehouses, and which will be used for the war department's supplies so long as forces are kept in France. The Norfolk navy yard was large increased in capacity, and considering all of the war activities at Hampton Roads on the north side from Old Point Comfort to the upper end of the Elizabeth river, and on the south side from Willoughby Spit to Norfolk, Hampton roads has been established as one of the best land-locked harbors on the Atlantic coast, with every facility for shipping, including coaling facilities.

N. D. Maher
Regional Director, Pocahontas Region

The Pocahontas region was carved off from the Eastern region in June, 1918, and was placed under the jurisdiction of N. D. Maher, formerly president of the Norfolk & Western and federal manager. A. C. Needles, vice president (operation) of the Norfolk & Western, succeeded Mr. Maher as federal manager, and George W. Stevens, president of the Chesapeake & Ohio continued as federal manager of the Chesapeake & Ohio. The region includes the Norfolk & Western, the Chesapeake & Ohio, and the Virginian—the three carriers of bituminous coal from the West Virginia coal fields to Norfolk, Newport News and Hampton roads.

The Virginian, having no western outlet for its coal, and no western connections for the interchange of other traffic, was before the war almost exclusively a carrier of tidewater coal. Nearly all of this coal has to be hauled up over Clark's Gap, a very heavy grade which, with its numerous single track tunnels, limited the capacity of the whole road. East from the summit of Clark's Gap, however, the grade is slightly descending. It was obvious that the western side of Clark's Gap must be double-tracked if the full capacity of the mines on the Virginian was to be developed.

There was presented here a clear-cut case of capital expenditures required by war conditions, and which would be required in the course of time under the ordinary conditions of the development of the country. The work was undertaken by the administration and the necessary funds



The Norfolk & Western and the Virginian East of Roanoke

were advanced to the corporation. The greater part of this double track work has now been done, but after the signing of the armistice further expenditures stopped. The corporation is left, therefore, with the burden of interest charges on capital expenditures made to meet war conditions, and presumably without the credit to complete the double track work and thus derive the full operating advantages and economies of completed improvement. The case well illustrates how necessary it will be for the government to take a broad and generous attitude toward the corporations when the roads are returned to them. The Railroad Administration was entirely justified in making the capital expenditures it did on the Virginian in view of the paramount importance of increasing the coal output, but in so doing forced the corporation into a difficult financial situation.

Both the Chesapeake & Ohio and the Norfolk & Western were very highly developed trunk line railroads capable of carrying coal either west or to tidewater at remarkably low cost—three to four mills per ton mile. The Chesapeake & Ohio had spent large sums for double tracking, heavier rail, etc., and especially for reducing the cost of hauling coal west. When the European war broke out, hauling coal east became of first importance, and a certain amount of readjustment became necessary, but this was soon made. It was only necessary for the Railroad Administration, when it took hold, to complete the new coal pier at tidewater, which it did.

The Chicago line of the Chesapeake & Ohio was taken away from it and placed in the Ohio-Indiana district of the Eastern region. This line from Cincinnati to Chicago is not of very great importance and it is probable that the Chesapeake & Ohio did not greatly need it under war conditions. However, the reasons for separating it from the main lines

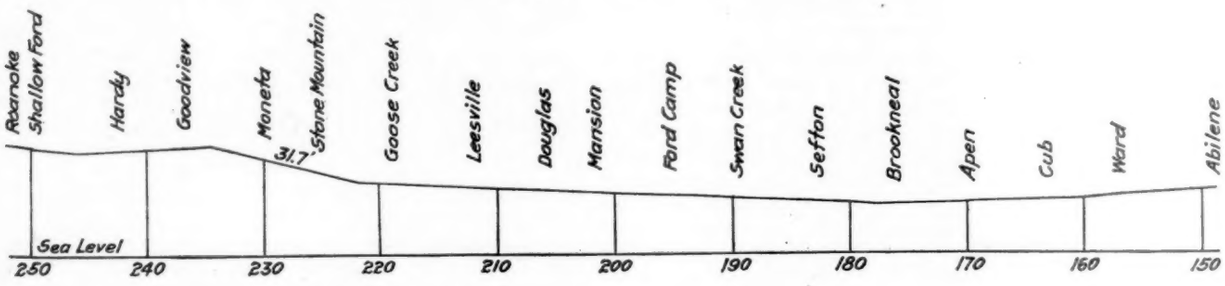
east are not very obvious and the separation worked a hardship on the corporation. It has now been restored to the Chesapeake & Ohio and is, therefore, in the Pocahontas region.

The Norfolk & Western had just completed a fifteen-year program of development and improvement when the United States entered the war. It was one of the most evenly developed properties in the country, comparing in this respect with the Atchison, Topeka & Santa Fe and the Union Pacific. Its ore dock was the first of its kind built at Norfolk, and it has proved thoroughly satisfactory, and the indispensability of some such dock is now everywhere recognized. Not only did the government find in the Norfolk & Western a perfected tool of enormous capacity, but it found even some of its own extraordinary needs forestalled. The company had just completed two large docks and warehouses outside of Norfolk. These were taken over as part of the storage plant which the army built under the direction of Colonel Samuel Felton.

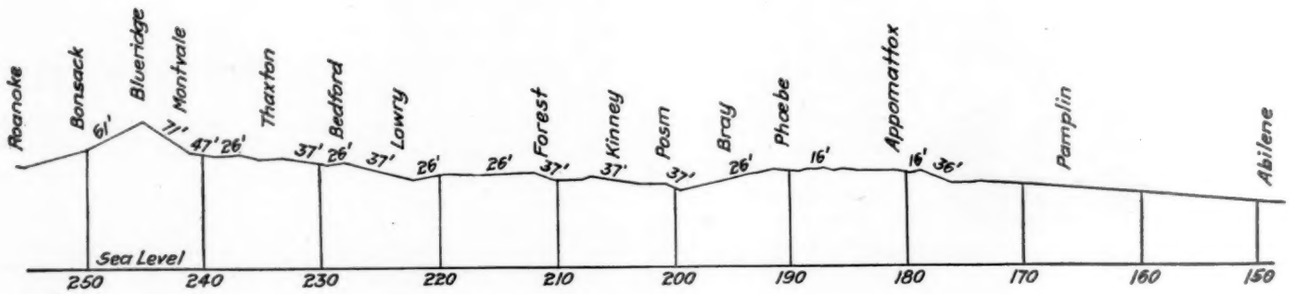
Here, then, were as good tools as could be asked for by the new regional director; nor was there any elaborate superstructure of organization that had to be created. Mr. Maher took jurisdiction without getting up from his desk. The new power to pool facilities, cars, and, above all, coal, increased the potential capacity of the roads brought into the new arrangement to an extent that can hardly be appreciated.

A glance at a large scale map of the region will show the great number of tendril-like branches of the railroads into different coal fields, but will hardly give an adequate idea of the number of separate mines operated by independent operators and by a multiplicity of companies. The so-called zone orders restricted the field in which these mine operators could seek a market for their coal. There still remained the fact that while one operator might have an order for ten cars of coal at a certain point which would be unloaded immediately on arrival, but which coal he was just beginning to load onto cars at his mines, another two or three operators would have an aggregate of ten cars within a few miles of point of destination of the first operator's coal. Under the pooling arrangement a few telegrams and a bookkeeping entry permitted the coal on the ground to be delivered to the purchaser, the completion of the transaction and the immediate release of ten coal cars. The power to do this sort of thing added at tidewater and the lakes almost 100,000 cars to the car capacity of the country.

Pooling of coal necessitated the mixing of coals and regrading. While the war lasted the coal operators stood it fairly patiently from a sense of patriotism. Pressure is now being brought to put an end to this great economy. The point of view of the coal operator is easy enough to understand. To get an order in the open market he must convince the buyer that his coal is better than that of his competitors at the same price. He cannot do this under present conditions where the buyer may have his order filled from any of a dozen different operators' coal.



Virginian Railway.



Norfolk & Western Railway.

Comparative Profiles

The most important and most interesting joint use of main line facilities in the Pocahontas region is the routing of freight trains, principally coal trains, over the Virginian from Roanoke to Abilene, eastbound, and the routing of empties, westbound, over the Norfolk & Western. The map and profile show plainly the advantages of this arrangement. The distance is about 105 miles on the Norfolk & Western and a little shorter on the Virginian. When the Norfolk & Western was originally built it was carried through Lynchburg, the most important city in that section of the country, and the junction with the main line of the Southern Railway. There is a big dip down at Lynchburg into the valley of the James river. Later a freight cut-off was made between Clay and Phoebe, and it is the profile of this freight line which is shown herewith. Later, also, a freight line was built from Pamplin through Abilene, rejoining the old main line near Burkeville.

The Virginian, built with the primary purpose of getting the best possible grade from the coal fields to tidewater, was run slightly south of east from Roanoke, crossing the main line of the Southern at Altavista, thus leaving Lynchburg

far to the north. The joint use of the two main lines makes for a very considerable economy. They are just the right length for a freight-train crew run and deadheading can be very largely eliminated. The difference in grades against eastbound traffic is very large. Such a cut-off as this could, of course, have been built by the Norfolk & Western, but it would have been difficult to have justified so large an expenditure to give the Norfolk & Western additional and more economical facilities alone; but, actually, the line is a part of a through road from the coal fields to tidewater, the existence of which and the expenditures on which are justified by reasons other than that simply of bettering the grades between Roanoke and Abilene. The joint use of it is a pure gain in the economy of railroad operation. About ten trains of the Norfolk & Western eastbound are now being sent each day over this piece of the Virginian.

As we look back now with the coal bins of industrial New England full, the needs of the army at Norfolk completely satisfied and the coaling of the navy no longer a war problem, the operation of the Pocahontas region, with its three low-grade bituminous coal roads, seems a comparatively simple piece of railroading; if we go back to the state of mind of a fuelless Monday last January we get a clearer conception of how successful operation of the Pocahontas region has been.

National Industrial Traffic League Spring Meeting

Max Thelen, Director of Public Service, Tells Delegates of Plans of the Railroad Administration

THE NATIONAL INDUSTRIAL TRAFFIC LEAGUE held its spring meeting at the Hotel Grunewald, New Orleans, La., on March 11 and 12, with R. D. Sangster, vice-president, presiding in the absence of G. M. Freer, president, whose new duties as secretary of the Central Coal Association would not permit him to attend. Mr. Freer, however, will complete his term as president. The meeting was attended by 200 representatives from the largest boards of trade and chambers of commerce in various parts of the country.

Max Thelen Speaks

Max Thelen, director of public service, was the principal speaker at the convention, addressing the delegates at the Tuesday morning session. He stated that though he might not always be able to do for them what they wanted, he wanted them to tell him their troubles, and that he could at least promise them sympathetic attention. He said the function of the Railroad Administration had changed, now that the war was over, and its purpose should be to give the public the best service possible. In his explanation of the veto power in the matter of rates now held by the director of public service, he stated that, while it could not give shippers the rates they wanted, it could at least prevent rates they do not want from going into effect, unless overruled by the director general himself, and that the making of general advances or readjustments that might disturb business conditions at this critical time was against the policy of the Railroad Administration.

Using the changes that have recently been made in General Order No. 57 as reference, he informed the members that other general orders were also under scrutiny, and that other changes might be expected. Consideration was now being given to the matter of import and export rates, and that of differentials between water and rail rates, and that some conclusion might be expected soon. He advised the shippers that whatever plan they might present as to off-line agencies would be considered carefully; that the so-called "sailing day" plan would be a subject of further study with the view of forming a definite plan that would be satisfactory, and to accomplish this he suggested the appointing of a committee by the league to assist the Railroad Administration with advice as to what should be done.

Referring to the freight traffic committees, he stated that his mind was open on the question of whether this plan of making rates ought to be continued, and he pointed out that there might be consideration as to whether the representation of the shipper of these commodities ought not to be increased so as to give them an even chance.

In his statement regarding the recent action by the Railroad Administration to improve conditions he brought out especially the proposed reform in the policy of handling claims, and asked the league to give him their constructive suggestions, that the work of the committee, of which he is chairman, charged with the duty of working out a new policy, may have the best possible results.

Sailing Day Plan

The "sailing day" plan was the subject of a lively discussion, which finally resulted in the adoption of a resolution, a substitute for the executive committee resolution on the same subject, and offered by C. E. Childe, of Omaha, Neb., which stated that the attitude of the league was opposed to the plan as at present administered, and, in accordance with the suggestion of Mr. Thelen to work in co-operation with him, made provisions for the appointment of a committee to present the views of the league on this subject to the proper officials of the Railroad Administration. The Childe resolution was an attempt to satisfy the delegates from all sections of the country whose views were divergent. Mr. Childe's sailing day resolution stated that the sailing day plan is a restriction upon commerce and causes the carriers to fail in their legal obligations of receiving and forwarding freight with all reasonable despatch; that this failure lays a heavy burden of extra expense upon the shipping public, and that the operation of this plan causes undue discrimination between markets. The resolution further stated that the league endorses the establishment of through package car service on schedule days throughout the country whenever traffic and commercial conditions reasonably warrant it; provided, however, that the lawful right of the shipper to deliver freight to any carrier for transportation on any day during business hours be in no way curtailed and that the committee to be appointed be instructed to take up immediately with each member of the league and obtain all possible information as to the working of the "sailing day" plan throughout the country and the practicability and necessity of providing through package car service where such is warranted.

Continuing the report of the executive committee, Mr. Barlow, on the subject of passing reports on the l. c. l. and c. l. freight and transfer records at junction points said that the plan of the Western Freight Traffic Committee for off-line representation had just been approved at Washington. His motion that the subject be referred to the special committee to be appointed on the "sailing day" plan was adopted. That committee was also made the agent of the league to take up

at Washington a number of other matters treated in the reports of the executive committee.

Four other resolutions were presented by Mr. Barlow and adopted by the league. On the matter of closing of freight stations, resolutions were adopted asking that the Railroad Administration be requested to issue an order immediately requiring a restoration of the pre-war opening and closing time at all freight stations, and that investigations be initiated by the Railroad Administration at points where congestion of less than carload freight obtain, and where it is found that terminals are not being used to maximum efficiency and capacity, that the hours for the delivery and the forwarding of freight be increased so as to utilize such freight stations to the maximum capacity and furnish maximum facilities for the convenience of the public.

The resolution adopted with respect to the shipper's right to route freight stated that the director general of railroads be requested to withdraw, cancel and annul any and all instructions or restrictions as to the routing or diversion of freight shipments that are at variance with published tariff provisions. A copy of these resolutions will be presented to the Director General of Railroads, with the urgent request that he give the matter his prompt consideration. The resolution maintains that there is no longer any necessity for the arbitrary routing and diversion of freight traffic by the Railroad Administration, and that it is of vital importance to the shipper that he should have control of the routing of his shipments so as to be able to direct the movement of them.

Rates on Export Traffic

The subject of export rates was handled by the league by the adoption of resolutions which indorse the principle of making lower rates on export traffic than are made on domestic traffic when such rates are necessary to enable industries in the United States to compete in foreign markets.

Mileage Scales

In regard to mileage scales, Mr. Barlow said that in the western and southern territories not much vitality had been observed in the last two or three months though they might still be alive. As to trunk-line territories, where mileage scales have also been out, he said it might be advisable to consolidate the half-dozen distance tariffs into one. Mr. Williamson, chairman of the committee on rate construction and tariffs, moved that this resolution as offered by the executive committee be deferred until after his committee had reported. After some discussion Mr. Williamson's motion prevailed. Mr. Barlow's committee offered a resolution opposing the submission of any further mileage scales, either class or commodity, for consideration by regional or district committees, or the adoption of any such scales by the Railroad Administration which will increase charges now in effect.

Mr. Barlow closed his report for the executive committee by stating that 59 new members had been received since the meeting last November, and reported, as a member of the Western Freight Traffic Committee, that the whole subject of increased minimum waste on foodstuff had been removed from docket, but that there would be some consideration given to the subject in individual cases.

Demurrage Rules

Charles Rippin, traffic commissioner of the Merchants Exchange of St. Louis, Mo., and chairman of the committee on car demurrage and storage, submitted a report of his committee on the recodification of demurrage rules. The report shows the result of much work by this committee in conjunction with a committee representing the American Railroad Association. The league adopted the report with slight exceptions. The purpose of this recodification is to bring the existing instructions, explanations and interpretations into the rules themselves, to clarify the rules in accordance with lawful practice, to obviate the necessity for future interpretations and to insure uniform application, but it is not intended to change or modify any of the principles in the present rules.

Mr. Ripley's Resolution

Paul Ripley, traffic manager of the American Sugar Refining Company of New York, offered resolutions bearing on the league's attitude with respect to the railroad problem, which had been presented by President Freer (after action by a special committee approved by the executive committee) to the Senate Committee on Interstate Commerce. Mr. Ripley's proposal did not agree, in some respects, with the action of the league, especially with respect to pooling.

A special meeting to consider the subject will be called when it is learned when Congress will be called into session. This meeting is to be called in time so that its deliberations can be presented to the proper committee of Congress.

Mr. Ripley's resolution stated that the National Industrial Traffic League has recorded unqualified opposition to government ownership, management or operation of railroads, has expressed disapproval of any extension of federal control beyond the limited period now prescribed by law, and has declared itself in favor of the prompt enactment by Congress of such legislation as will provide a uniform system of regulation in essential matters, safeguard the public interest, ensure adequate revenue to provide for equitable treatment of all questions affecting wages and working conditions of employees and attract sufficient capital to maintain and develop transportation facilities which shall meet the necessities of the commercial, manufacturing and agricultural interests of the country and proposed the following plan of procedure be recommended in regard to the future status of railroads.

(1) That the policy of the Government shall be manifested by restoring the individual organization of each system to operate the property for account of the Government, subject only to such supervision by the Director General of Railroads as may be necessary to protect the interests of the Government.

(2) That the final relinquishment of the properties should not be delayed longer than is absolutely necessary for the enactment of remedial legislation, and that such legislation should be expedited by an extra session of the Congress to be convened at the earliest practicable date.

(3) That remedial legislation to be enacted should recognize the following principles:

(a) That all rates, regulations and practices of carriers under Federal control which shall have been filed with the Interstate Commerce Commission, whether on interstate or intrastate traffic, and which have not been superseded by action of the Interstate Commerce Commission or of the Director General of Railroads on the date on which Federal control of said carriers shall be relinquished, shall remain in effect on the lines of all carriers subject to the Interstate Commerce Act until changed by action subsequently taken according to law.

(b) That a guarantee to the carriers of a specified return upon either capital or investment should not be undertaken because it would discourage individual initiative, stifle incentive to efficient management and destroy competition, but that the regulating agency shall take into consideration the cost of labor and other operating costs in reaching a conclusion as to the reasonableness of rates, and that the carriers shall be permitted to earn sufficient revenue to provide safe and sufficient service, to protect existing investment and to attract new capital necessary in the public interest.

(c) That any undue discrimination between state and interstate rates, rules, regulations or practices, that places an undue burden upon Interstate traffic shall be declared unlawful and that the Interstate Commerce Commission shall be authorized and required, upon complaint of shipper, State Railroad or Public Utility Commission, carrier, or any other interested party, to determine the propriety of the relation existing or contemplated between the rates, rules, or practices upon traffic wholly within one State and upon interstate traffic, and make final decision with respect thereto.

(d) That the carriers shall be authorized to make such agreements for the co-ordination of their practices and facilities as may be in the public interest when approved by a national governmental agency.

(e) That the *exclusive* jurisdiction over the issuance of securities shall be vested in the same national governmental agency by which rates are controlled and regulated.

On Tuesday night an informal dinner was given by the league at the Hotel Grunewald. Among the speakers were Francis B. James, of Washington, D. C., who gave a talk on the interpretation of laws in general bearing particularly on common law, and M. J. Sanders, of New Orleans, federal manager of the Mississippi-Warrior River Section of the Inland Waterway Section of the Railroad Administration, who spoke on the developments of river traffic.

General Pershing and Brigadier General Atterbury

General Pershing Compliments Work of the Railway Men

Congratulations Expressed in Letter to Brigadier General Atterbury—The Latter's Reply

FRANCE, February 20, 1919.

BRIGADIER GENERAL WM. W. ATTERBURY,
Director General of Transportation,
Headquarters, S. O. S., American E. F.

MY DEAR GENERAL ATTERBURY:

Permit me to take this opportunity of expressing to you, to your officers and soldiers of the Transportation Corps my appreciation of their services to the American Expeditionary Forces.

From its inception in September, 1917, I have watched with the greatest interest the progress you have made. You have been called upon to organize base ports and to operate them in connection with the terminal yards and the necessary road train service connecting these yards; to instruct and assign railway transportation officers at all important stations in France; to erect cars and locomotives; to arrange and perfect details for troop movements and to maintain through all a most varied and difficult liaison service with the French.

All this you have done with a shortage of personnel, equipment, and with facilities that were lacking, due to unavoidable delays in construction.

Please convey to your officers and enlisted men my personal congratulations and appreciation, and that of their comrades of the American Expeditionary Forces for the splendid work they have done.

Each member of the Transportation Corps, whether stationed at a base port or at an advanced railhead, has contributed to the victory of our armies, and I want each man to understand my full appreciation of this.

Sincerely yours,
(Signed) JOHN J. PERSHING.
24 February, 1919.

GENERAL JOHN J. PERSHING,
Commander-in-Chief,
American Expeditionary Forces,
General Headquarters, France.

MY DEAR GENERAL PERSHING:

It is a pleasure to acknowledge the receipt of your letter of February 20th.

Needless to say, it is highly gratifying to me—as it will be, I am sure, to the officers and soldiers of the Transportation Corps as a whole, each of whom will be furnished a copy of your letter—to note the generous terms in which you speak of the service that has been rendered by the Transportation Corps toward the success of the American Expeditionary Forces.

To know that their Commander-in-Chief is familiar with the work they have done, and gives due credit to the part they have played in helping to win the war, will be to both officers and soldiers full reward for their efforts, and at the same time will stimulate them to maintain during the remainder of their service in France the zeal and energy that uniformly has characterized their performance.

No body of men has worked harder, nor with a keener spirit of intelligence, energy and patriotism, and I am more than proud to have been in charge of such an organization.

Personally and on behalf of the entire Transportation Corps I desire to express to you our grateful appreciation of the tribute that you have paid the Corps.

Yours very sincerely,
(Signed) W. W. ATTERBURY,
Brigadier General, U. S. A.

Report on the Automatic Straight Air Brake

Synchronous Operation With Brake Apparatus Now in Common Use Secured in Extensive Tests

THE INTERSTATE COMMERCE COMMISSION on March 4 submitted to Congress the report of a series of tests conducted by the Bureau of Safety of the air brake system of the Automatic Straight Air Brake Company of New York, as a result of which the bureau submitted the following conclusion: "In the tests of the automatic straight air brake system, both Westinghouse and automatic straight air locomotive apparatus was used with trains made up of various arrangements of Westinghouse and automatic straight air triple valve equipment, and the tests were made under varied operating conditions. Synchronous operation of the automatic straight air brake system with brake apparatus now in common use was secured in all of these tests. On trains equipped entirely with automatic straight air triple valves the reliability and flexibility of the automatic straight air brake system were sufficiently demonstrated." This conclusion, together with a report submitted to Congress June 29, 1916, is the result of a study and test of this system during a period of several years, beginning in 1910, when the triple valve was presented to the Block Signal and Train Control Board, and including experimental tests on the Atchison, Topeka & Santa Fe in 1915 and extensive rack tests and service tests on the Virginian Railway during the period from March to July, 1918.

The apparatus recently tested is a development of that formerly controlled by the California Valve & Air Brake Company of Los Angeles, Cal., tests of which were made by the bureau in November, 1915, which were the subject of the report to Congress in 1916. The tests which are the subject of the new report were made first with the apparatus installed on a 100-car test rack in New York City and later on the Virginian Railway with the same brake apparatus installed on cars used in coal service between the mines in West Virginia and the docks at Sewalls Point, Va.

As presented to the commission for test, the apparatus comprises a triple valve, a high volume feed valve and a compensating valve. The triple valve tested is of the 3-unit type,* the three units being a service section, an emergency section and a change-over section; the equipment also includes a quick action reservoir and a service reservoir in addition to the present auxiliary reservoir and brake cylinder.

This apparatus is designed to produce essentially the following operating results:

(1) Rapid serial action in service applications and in quick release.

(2) The maintenance of uniform and constant brake cylinder pressure, irrespective of piston travel or cylinder leakage. The cylinder is fed from the brake pipe, the pressure in which in turn is maintained by the compensating valve while the brake valve is in lap position.

(3) Graduated release, permitting a variation of brake cylinder pressure at the will of the engineman.

(4) Quick release when desired.

(5) Emergency applications of the brake available at any time during or after any service application, and an automatic emergency application on depletion of train pipe pressure to approximately five pounds.

As is suggested by the name, the design of this system combines features of the automatic air brake and the straight air brake. Apart from its use to obtain quick release of brakes, auxiliary reservoir air is used only in emergency application. In service application brake cylinder air is obtained from the brake pipe and service reservoir, the auxiliary reservoir serving as a constant pressure chamber to regulate and govern brake cylinder pressure in proportion to brake pipe reduction. The design of the triple valve is such that in a service application the build-up of brake cylinder pressure as compared with the reduction of brake pipe pressure is in the ratio of 2 to 1.

The high volume feed valve and the compensating valve of this system form a part of the brake equipment installed on the locomotive. The high volume feed valve performs the functions and takes the place of the feed valve commonly used, the purpose of this valve being to remove any restriction between brake valve and brake pipe when brake pipe pressure is below the pressure for which the feed valve is adjusted. The compensating valve is designed to compensate for brake pipe leakage during service application, as well as for depletion of brake pipe pressure by action of the triple valves in automatically compensating for brake cylinder leakage; its function is to maintain brake pipe pressure equal to the equalizing reservoir or chamber *D* pressure. It may also be used to perform the functions of the equalizing discharge valve.

Tests on Virginian

The report includes a description and analysis of standing and running tests on the Virginian Railway from June 4 to July 9, 1919.* In the first tests, series A, the entire 100 cars were used and tests were made before the brake equipment was changed in any respect. When the A. S. A. equipment had been installed on 10 cars, standing and running tests were made, series B, with a train of 50 cars, 40 equipped with the original Westinghouse equipment and 10 with A. S. A. equipment in blocks of four Westinghouse and one A. S. A. In series C, standing tests only were made with 90 cars, 81 equipped with Westinghouse triple valves and 9 with A. S. A. equipment, in blocks of nine Westinghouse and one A. S. A. In series D, E and F a 50-car train was used, 25 cars having each type of triple valve equipment. In series D the cars were arranged in blocks of five Westinghouse and five A. S. A.; in series E and F, the cars of each kind were grouped together, in one case with the A. S. A. ahead and in the other with the Westinghouse ahead. For the standing tests, series G, a 100-car train was used, 81 cars equipped with A. S. A. apparatus and 19 with Westinghouse, with the latter on every tenth car and on cars 20 to 30 inclusive. In series H all cars were equipped with A. S. A. triples, and standing tests were made with two trains consisting of 50 and 100 cars, respectively, and running tests were made with a 50-car train. In series I, 100 cars were equipped with A. S. A. apparatus; standing tests were made and the train was run from Princeton to Roanoke. At Roanoke the A. S. A. triples were removed from 50 cars and replaced by the original Westinghouse K-2 triples for the series K tests, which consisted of a test trip from Roanoke to Victoria with the first 49 cars and the rear car equipped with A. S. A. apparatus. Series L consisted of a trip from Victoria to Sewalls Point with the Westinghouse cars on the head end. In all, the schedule included about 70 tests, standing, terminal and running.

In series A, brake cylinder leakage tests and retaining valve tests were made for the purpose of securing a record

*For a detail description of this equipment see the *Railway Age Gazette* for October 19, 1917, page 697.

*For a description of the test equipment and an account of the final test runs from Princeton to Sewalls Point, see the *Railway Age* for July 26, 1918, page 173.

of the condition of the brake equipment. The purpose of the tests in series B, C, D, E, F and G was to demonstrate the operation of both types of triple valves in trains of mixed brake equipment, with and without the A. S. A. engine equipment.

The purpose of the test run from Princeton to Roanoke was to demonstrate the ability of the A. S. A. brake equipment to control a long train on heavy grades, as well as the flexibility of the system for controlling a train on undulating and level grades.

Leaving Princeton, the A. S. A. locomotive apparatus was in service, and on all cars the brakes were operated in graduated release. In making the first brake application after starting down the grade, three brake pipe reductions were made, the total reduction being from 87 to 70 pounds, as indicated by gages on the locomotive; as a result brake cylinder pressures of 36, 29, 35 and 38 pounds were developed on the 1st, 29th, 60th and 95th cars. Following these reductions, the brake valve was not moved to release position in time to restore brake pipe pressure quickly enough and the train stopped before the brakes were released. As soon as pressure was restored the train was again started and a speed of 10 or 11 miles per hour had been attained when an emergency application occurred, due to an air hose being blown off from the 94th car. The train did not part, and was stopped without shock on either end. When the hose had been replaced and pressure restored, the train was started and a reduction of brake pipe pressure from 86 to 70 pounds was made for the purpose of controlling speed. Following this application, as the brakes were being graduated off when speed had been considerably reduced, the train parted, due to the coupler on the 85th car slipping over the top of the coupler on the 84th car, the carrier iron having fallen. This caused an emergency application, and although the speed was very low both portions of the train stopped without shock. Repairs were made and the train proceeded to Kelleysville without stop; the brakes were applied and graduated off and on as required to control the speed, which varied from 16 to 22 miles per hour. No difficulty was experienced in controlling the rate of speed, and the operation of the train was notably free from shock.

At Kelleysville the brakes on all cars were placed in quick release and the train was operated with brakes in that condition from Kelleysville to Whitethorne. Approaching the New River bridge as the brakes were being released following an application, the train parted between the 66th and 67th cars on account of a broken knuckle. The emergency brake application brought both portions of the train to a stop without damage or shock. Again, approaching Rich Creek the train parted between the 89th and 90th cars, due to a broken knuckle, while the brakes were being released, and the brakes on the head end back to about the 60th car had been released. Brake pipe pressure having been restored at the head end, higher brake cylinder pressure on the cars at the head end was built up in the emergency application than on the cars farther back. Notwithstanding this emergency application originated near the rear end, serial action of the brakes from that point to the head end was so rapid that the higher brake cylinder pressure developed on the head end stopped that end of the train first, causing a rather severe run-in of slack. However, the shock was not severe enough to cause any damage and when the coupler had been repaired the train proceeded.

At Whitethorne the brakes of all cars were again placed in graduated release. After passing Merrimac the first two applications of the brakes which were made on the grade east of that point were heavy, and each time the train was stopped before the brakes were released. Subsequently lighter brake applications were made and the speed of the train was controlled properly.

At Roanoke the A. S. A. triple valves were removed from 50 cars and the Westinghouse triples were replaced. On the trip from Roanoke to Victoria the train was made up with the first 49 test cars and the rear test car equipped with A. S. A. apparatus and cars 50 to 99, inclusive, were equipped with Westinghouse triple valves; from Victoria to Sewalls Point the first 50 test cars were equipped with Westinghouse triples and the last 50 with A. S. A. The purpose of these arrangements was primarily to determine what, if any, slack action there would be between cars with different types of brake apparatus grouped together in large numbers in different parts of the train and whether proper synchronous and serial action would be obtained under varied braking conditions encountered.

The trip from Roanoke to Victoria was made on July 8. Leaving Roanoke the brakes on 49 A. S. A. cars were operated in graduated release. On the grade between Goodview and Huddleston very light brake pipe reductions were made for the purpose of controlling speed, the reductions varying from two to four pounds each. At Stone Mountain approximately half-way down the grade the train was brought to a stop to meet an opposing train. From that point it proceeded to the bottom of the grade without a stop, the operation being remarkably smooth and free from shock.

At Taber, 54 miles east of Roanoke, the brakes on the A. S. A. cars, except the first 25, were placed in quick release and the trip from Taber to Victoria was completed with the brake apparatus in that condition. Near mile post 129, about 9 miles west of Victoria, while running at a speed of about 20 miles per hour, the train parted between the 99th and 100th test car, due to a short knuckle pin and the top coupler lug being broken off. Before the break-in-two the brakes were not applied. The emergency brake application brought it to a stop without damage or shock.

The run from Victoria to Sewalls Point was made on July 9. A box car loaded with equipment and tools was hauled next to the locomotive, and there were four cabooses on the rear end; the brakes on the cabooses were not used. Approaching Purdy, approximately 40 miles east of Victoria, there is an ascending grade eastbound of .2 per cent followed by a descending grade of .21 per cent for a short distance and then by a descending grade of .5 per cent. Approaching Purdy an application of the brakes was made and before the rear end had reached the crest of the ascending grade, the head end being on the descending grade, the brake valve was placed in full release position for a period of nine seconds and then returned to running position. The train parted between the 82nd and 83rd cars, the knuckle on the rear end of the 82nd car being broken. Trainagraph charts indicated that prior to the break-in-two the brakes had been released back to about the 50th car, and it is apparent that the contour of the line, together with the short release period and a bad flaw in the knuckle caused the break-in-two. After the knuckle had been repaired the trip to Sewalls Point was completed without noteworthy incident.

Discussion

In the discussion of the tests, the report says the A. S. A. brake equipment is considered, first, as used in mixed trains with other types of brake apparatus now in common use, and, second, when A. S. A. brake equipment exclusively was used in the test trains. In mixed trains, in both standing and running tests, synchronous operation with the Westinghouse apparatus was obtained, and the control of mixed trains having a large percentage of A. S. A. triple valve equipment under varied braking conditions, including heavy, undulating and level grades, was, with but one or two exceptions, notably free from shock.

The design and construction of the A. S. A. triple valves used in the Virginian tests provided for low brake cylinder

pressure for a given brake pipe reduction, as compared with the Westinghouse triple values, particularly in view of the short piston travel maintained on the Virginian Railway. In mixed trains better braking conditions would be provided and more harmonious operation with other types of brake apparatus if the A. S. A. brake provided higher brake cylinder pressure in proportion to brake pipe reduction. It is noted that this is merely a detail of construction and an increase in the present ratio can easily be obtained.

In mixed trains with the A. S. A. triple valve equipment on the head end the functions of graduated release were accomplished and tests demonstrated that the graduated release feature of the A. S. A. triple when used on the head end of mixed trains is very desirable under operating conditions similar to those encountered on the Virginian Railway, also emergency operation of the A. S. A. cars on the head end of mixed trains was obtained following a service application when the initial reduction was not too great. The use of A. S. A. triple valves in mixed trains on account of locally reducing and increasing brake pipe pressure results in some degree in more positive operation and an improvement in serial action both in applications and in releasing the brakes, the degree being dependent upon the number and location of the A. S. A. triple valves in the train.

On cars equipped with A. S. A. apparatus, the A. S. A. triple valves supplied comparatively uniform brake cylinder pressure which was not affected by piston travel, brake cylinder leakage or pressure retained in the brake cylinder at the beginning of an application; but under present practices of controlling trains the brakes ordinarily are not held applied long enough to obtain the full advantage in mixed trains of the feature of compensating for brake cylinder leakage.

In the standing tests with trains having all cars equipped with A. S. A. triple valves, practically all the intended functions were accomplished. In general, proper serial action in both application and release was obtained; when operating in graduated release the brakes were graduated on and off as desired, being fully released as intended when normal brake pipe pressure was restored. Comparatively uniform brake cylinder pressure was obtained regardless of piston travel or of pressure retained in the brake cylinders by the retaining valves, and it was maintained notwithstanding ordinary brake cylinder leakage. Emergency operation following a service application was not secured in every case when desired; after the installation of the special emergency valve on the locomotive, emergency operation was secured when the initial service reduction was 20 pounds or less. The emergency tests demonstrated that after a full service reduction followed by a full release period as short as 10 seconds emergency operation of the triples throughout the train can be secured. The automatic emergency feature of the triple valves tested, which becomes effective when the brake pipe pressure had been depleted to five pounds or less, was so much delayed as to be of little or no practical value; to make this feature of the brake system useful the period of time required before the automatic emergency operation occurs must be materially decreased, which can be accomplished by making this function operative at a higher brake pipe pressure. In the test providing for an angle cock on the rear end of the train to be opened with the brake valve in running position, the emergency operation carried to the head end of the 100-car train.

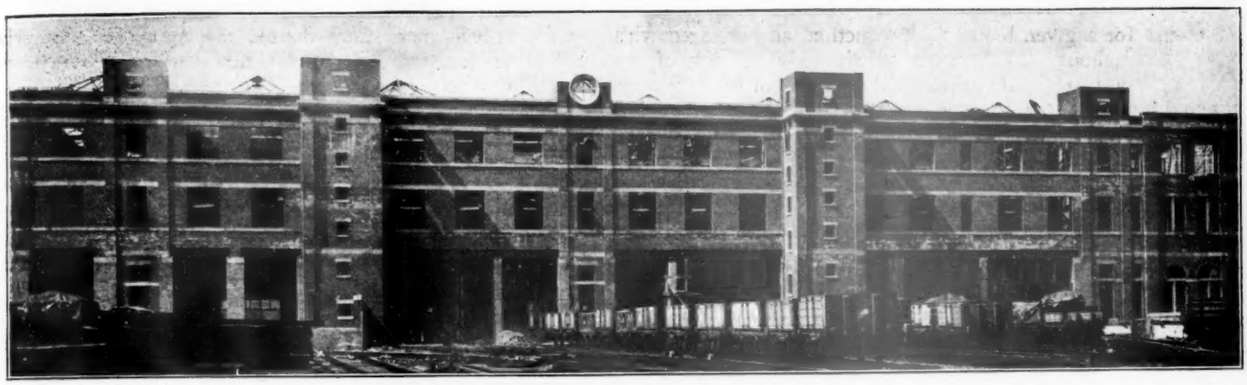
In the running tests on the grade between Princeton and Kelleysville with 50 and 100-car trains equipped exclusively with A. S. A. triple valves the operation of the brakes was precise and uniform and the control of the slack action during application and release of the brakes was practically ideal. The speed restriction for freight trains on this grade is 12 miles per hour, but was not observed in common practice. The test trains were in several cases permitted to attain speeds more than double the maximum authorized before the brakes were applied, necessitating a heavy brake application to control them. The pressure developed in the brake cylinder was comparatively uniform except on the head end, where high brake cylinder pressure resulted from an overcharge of the brake pipe while the brake valve was in full release position. The release of the brakes even at as low speed as two miles per hour resulted in no bad effects from slack action, but, on the contrary, was very uniform.

In the two cases when the train parted between Kelleysville and Rich Creek the brakes had been released on the forward portion of the train and the break-in-twos occurred between cars farther back in the train on which the brakes were still applied. In neither case was there any noticeable shock or slack action at either end of the train prior to the break-in-two. At the time of these break-in-twos all of the triple valves were operated in quick release and no retaining valves were used. None of the emergency operations on the 100-car train on the trip from Princeton to Roanoke, originating at different points in the train, caused excessive shock and no damage to train or equipment resulted, notwithstanding the low rate of speed in the first two instances. After turning the summit of the grade at Merrimac, all cars being in graduated release, an excessive brake pipe reduction was made; in attempting to release the brakes the brake valve was held in full release position long enough to fully release the brakes on the head end, but the train was stopped before release on the rear end was secured. This resulted in slack running out, and a comparatively severe shock on the rear end, but this shock was not severe enough to cause any damage. When the break-in-two occurred at Purdy the brakes had been released on the first half of the train only and the rise in brake pipe pressure had barely reached the first A. S. A. car when the train parted; this break-in-two was also clearly due to improper manipulation of the brake valve rather than to any arrangement or feature of the triple valve equipment.

The A. S. A. feed valve and the compensating valve included in the A. S. A. locomotive equipment operated as designed and intended. The tests demonstrated that it was not necessary to use any special locomotive brake equipment in order to secure proper action of the A. S. A. triple valve, but the maintaining and compensating functions of the A. S. A. triple valves can be more fully accomplished and utilized when the compensating valve on the locomotive is used. Some alteration in the detail arrangement of the compensating valve on the locomotive as used in these tests is necessary in order not to interfere with emergency operation following a service application. When the compensating valve is in service in case of the train parting or a break in train line the engineer's brake valve must be placed in emergency position in order to prevent depletion of the main reservoir pressure.

In the tests of the A. S. A. brake system particular attention was devoted to principles of design and the functions accomplished. Some improvements, particularly in regard to the feature of securing emergency operation following a service application, can be effected and the construction of the A. S. A. triple valve can be materially simplified. An application of the principle of automatic straight air brake valves to meet the conditions of passenger train breaking was not considered in connection with these tests, which were entirely with freight equipment.

The removal of the purchasing office of Morgan's Louisiana & Texas Railroad & Steamship Company from New Orleans, La., to Houston, Texas, "smacks of inexcusable favoritism" by the Railroad Administration, according to a telegram sent by Martin Behrman, mayor of New Orleans to the director general of railroads.



Exterior View of the Station Before Completion

North British Railway Improvements at Glasgow

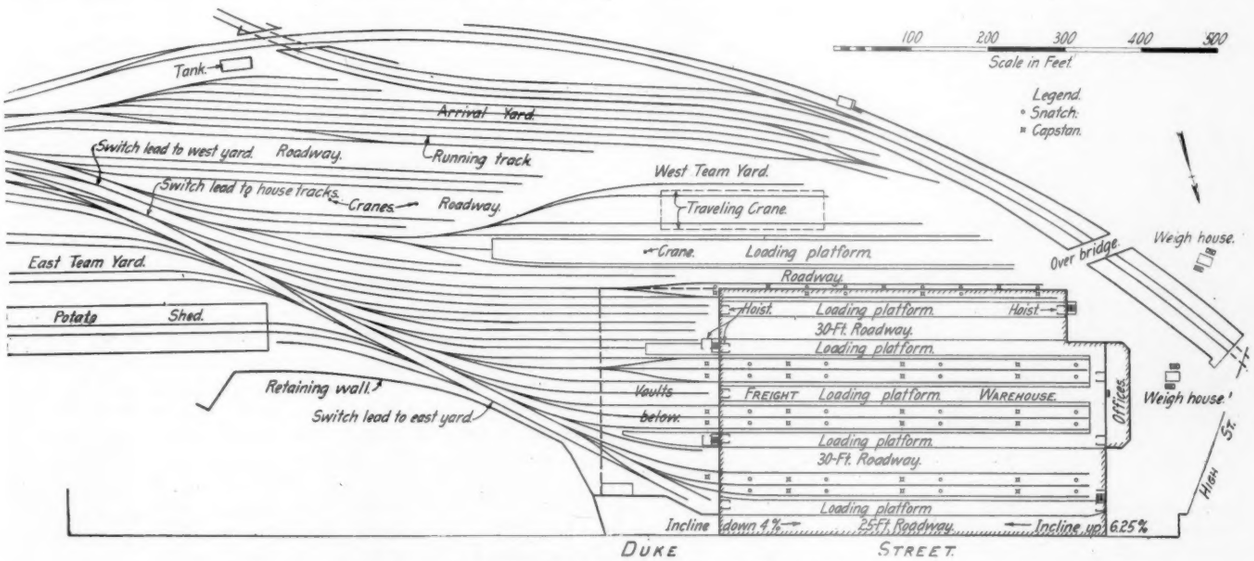
The New Central Freight Yard and House Is the Largest and Best Equipped Terminal in Scotland

By Frederick C. Coleman

TRANSPORTATION FACILITIES throughout the Glasgow district of Scotland have been materially improved by the opening by the North British Railway of a new freight yard and warehouse at High street, Glasgow. This large and modern development utilizes mechanical equipment to such a large extent to handle the freight that it provides interesting precedent for similar freight house design in this country. For that reason it is described in detail below.

This project involved an outlay exceeding $3,400,000 and comprises the entire reconstruction and the considerable extension of the old freight station and terminal yard at that point; the establishment on an adjoining site of a new coal yard, and the widening for a distance of two miles of the approach lines to the new terminal; that is to say, as far on the Coatbridge line as Parkhead station. The new freight station, which is the largest and best equipped freight terminal in Scotland, provides extensive storage accommodations as well as the facilities for handling the general daily freight traffic. Half a million tons of traffic are now being handled monthly at the new station, the total number of cars in and out being approximately 400 each way daily, while 600 cars are exchanged daily with the Glasgow & South Western railway.

The building, the location of which is shown in the map, is 499 ft. long and 315 ft. wide. It consists of three floors and basement. The two upper floors and the basement are reserved for storage purposes, while the track level floor is used solely for the general daily station traffic. This floor is served by 10 tracks inside the warehouse, as well as 5 double-sided loading platforms, with a standing capacity for 160 cars and having a superficial area of about 31,950 sq. ft., and three roadways providing 2,340 lin. ft. of standing room for the loading and unloading of trucks. The roadway area exceeds one acre.



Layout of the Freight House and Team Yards

The storage accommodations on the two upper floors and the basement are on the same liberal lines, the area of the second floor being 130,356 sq. ft., while that of the third floor is 142,830 sq. ft., or nearly 3 1/3 acres. The basement is more extensive, as it has been carried beyond the east end of the warehouse proper by means of arched vaults under the yard tracks. The area of this floor is 185,310 sq. ft.

In order to facilitate team traffic to and from these storage floors special driveways, independent of the general station accesses, have been provided. That to the basement is brought in on a descending grade from Duke street, at the east end of the warehouse, while that to the upper floors enters at the west end, rising from the junction of Duke and High streets to the required level, and being continued along inside the north wall of the warehouse for its full length on the level of the second floor. A series of large openings in these upper floors serve to give light and ventilation over the entire area of the building.

For the purpose of comparison it may be said that the total area occupied by the new yard and warehouse is 16 acres as against 12½ acres occupied by the old yard and warehouse; that in the old building there were only 18,000 sq. ft. of loading platform area as compared with 155,070 sq. ft. provided on the track level floor of the new warehouse and that the old yard provided capacity for 56 cars only while in the new one provision is made for 81 cars.

The outstanding feature of this warehouse is its equipment for the handling of traffic, and the unusually large electrical plant which is provided with a view to the rapid and easy disposal of a heavy volume of freight. The tracks inside the building are arranged in sets of three, the two outside tracks of each set being used for loading purposes, while the center track is used for removing the empty cars from or feeding the loaded cars to the outer tracks.

As no locomotives are permitted inside the warehouse building the cars are handled by 30 electric capstans, each

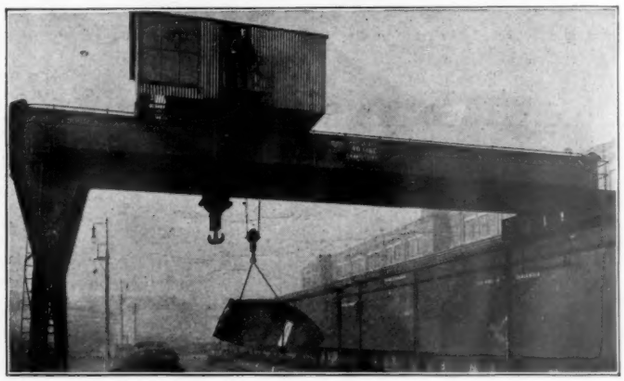
The Revolving Electric Crane

capable of exerting a pull of one ton and hauling about 100 tons on the level at a speed of 250 ft. per min. Each capstan is worked by a 26-hp. motor running at 400 r. p. m., driving the capstan head through a worm gear reduction. An automatic solenoid brake is fitted on the armature shaft, capable of stopping the capstan instantly when the current has been cut off. The controller, of the capstan type, is worked from the ground level by means of a foot plunger.

Thirteen 1½-ton and two 3-ton overhead revolving cranes have been provided, all arranged to work over the ground floor, and used for loading and unloading both cars and trucks and for general lifting and transport purposes about the various loading platforms. The cranes are placed parallel to each other and at right angles to the railway tracks, so that whenever the necessity arises a number of cranes may be concentrated on one line of cars, insuring a rapid discharge with a minimum number of cranes. Each crane consists of a traveling gantry of 24-ft. 10-in. span, from which is suspended the balancing revolving jib, having a radius of 23 ft. Lateral, vertical and horizontal movements are provided in the cranes and each movement is controlled by separate electric motors at the following speeds:

Three-ton Cranes.—Lifting 3 tons at 50 ft. per min.; motor 17½ hp. at 400 r. p. m. Horizontal, 3 tons at two r. p. m.; motor 2¾ hp. at 670 r. p. m. Traveling, 3 tons at 300 ft. per min.; motor 7½ hp. at 625 r. p. m.

One and one-half-Ton Cranes.—Lifting 1½ tons at 100 ft. per



The Goliath Yard Crane

min.; motor 17½ hp. at 400 r. p. m. Horizontal, 1½ tons at 2.3 r. p. m.; motor 2 hp. at 800 r. p. m. Traveling, 1½ tons at 360 ft. per min.; motor 4½ hp. at 650 r. p. m.

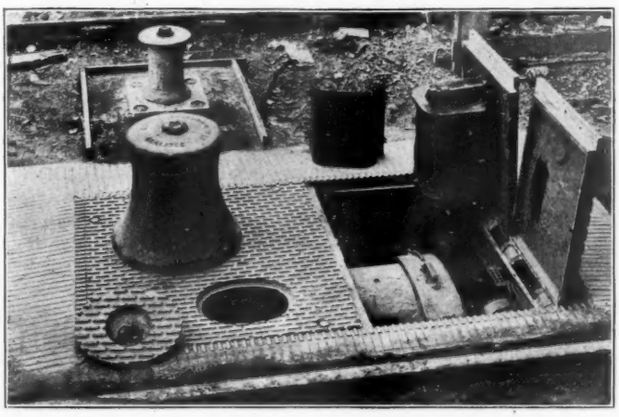
The framework of the cranes, including the jib and gantry, is of steel. The jib is connected to the gantry by means of a steel center pillar rigidly fixed in the steel center framing on the gantry. The dead weight of the jib is carried on a ball bearing fixed at the bottom of the pillar, while the horizontal thrust is taken on the rollers located at the top of the jib framing. A cage for the operator is provided immediately in front of the pillar, where he has an uninterrupted view of the operations and is within easy reach of the various controller handles. The lifting and traveling motions are fitted with automatic limit switches. By means of a series of trap doors in the loading platforms, freight arriving by rail for storage in the basement can be lowered readily by the cranes, while freight in the basement requiring shipping by rail can be similarly handled.

Facilities are also provided on the upper floors for the rapid handling of freight by means of electric traveling cranes mounted on a runway suspended from the roof girders. The loads are lifted from the railway trucks in the loading way through wells in the floors, and are distributed by the travelers over the area of the floor covered by the respective tracks. Each track is 280 ft. long. There are four of these cranes for each floor, each capable of lifting 3,000 lb. The hoisting speed under full load is 100 ft. per min., accelerating to about double this speed for light loads, and the traveling speed is 350 ft. per min. The height of lift for the cranes on the first floor is 34 ft., and for those on the second floor 50 ft. The motors are of the totally enclosed series-wound type, of 17 and 2 hp. respectively. The travelers are under the control of an operator, who is accommodated in a small cage attached to one end of the framework. An emergency switch is provided in each operator's cage. The framework of the travelers consists of rolled steel channels and angles.

The vertical motion is fitted with the Royce patented auto-

matic governor lowering gear, a safety device by which the speed of lowering of all loads is automatically prevented from exceeding a safe limit, and which thus provides an additional safeguard in the event of an accident occurring to the solenoid brake provided on the first motion shaft of the hoisting motion. The normal position of the brake is always "on" and is released only when the motor is started. An oil dashpot is provided for the brake to regulate its rate of operation. A special hand release device is provided for the brake by which it can be released by hand by the operators from the cage, thus allowing loads to be lowered by gravity without the expenditure of current.

The hoisting motion is fitted with an overwinding safe-



One of the Electric Capstans

guard, consisting of a striker rod connected to a circuit-breaker, by which, in the event of the load being lifted too high, the circuit is broken, the hoisting motor is stopped, and the brake applied. A further safeguard is provided by the fitting of one of the wheels on the hoisting motion with a special slipper device, which permits the hook being lifted against a dead stop on the crane framework, although at the same time it prevents any load on either the hoisting motor or gearing. So if the hook, when being lifted, catches in the side of the wells in the floor, no damage to any part of the crane results. This device is also fitted on the traveling motion, so that in the event of the traveler getting "jammed" through any cause, the motor and gearing will not be damaged by overload.

To prevent the over-running of the travelers a circuit breaker is used which is actuated by stops fixed at each end of the tracks at a safe distance from the end. The circuit breaker is fixed immediately over the operator's cage, so that after over-running it can be reset by the operator and the machine restarted.

Six jiggers or short-travel cranes, also of 3,000-lb. capacity, are provided on the upper floor. These serve the roadway on the floor below along the north side of the warehouse, through the trap doors in the floor, while three others placed in outside walls on the south side of the building are used for raising goods from the yard to either floor, and conversely. The general design of these is similar to that of the travelers, with the exception that the controllers are fixed on the warehouse floor near each track, and the operator's cage is thereby dispensed with. Furthermore, the travel is only 10 ft., and the height of lift 50 ft. The hoisting speed for the full load of 3,000 lb. is 100 ft. per min., and the traveling speed 200 ft. per min. The motors are similar in size to those in use on the cranes.

In addition to these appliances, nine electric hoists, each of 3,000 lb. capacity, have also been provided, four at the west and five at the east end of the building, and are available for use on all the floors, communicating directly with the loading tables on the rail floor. Two other hoists of the same capacity have been added for the use of the portion of the basement lying to the east of the building proper under the yard; they communicate directly with two loading platforms provided with special siding accommodations, apart altogether from the warehouse platforms and sidings. All of these lifts are arranged to carry the maximum load at a speed of 150 ft. per min. and are each driven by 26-hp. motors running at 400 r. p. m. The cages are steel framed, lined with timber, and kept in position by suitable guides fixed to the sides of the lift shaft. Automatic safety gear is provided and so arranged that in the event of the lifting rope breaking, the cage will be held in the guides safely. The lifting gear is driven through machine cut spur gear, and is provided with an automatic solenoid brake and a mechanical brake to control the lowering speed, either brake being capable of holding the full load independently. The dead weight of the cage is partly counterbalanced by the cast iron weights which run in separate guides fixed in the shaft. The controllers, which are of special lift type, can be worked from the cage in any position.

Originally, the movement of cars from the outer road to the center road and vice versa was effected by means of electric traversers running on rails laid at right angles to the tracks. The cars were placed on to the traversers by means of the electric capstans, one at a time, and traversed across to the required track, where they were then run off, the traverser thereafter being removed back out of the way. Eleven of these machines were provided at the rail level, but experience proved that the electric crane equipment was able to deal with all loads from cars inside the warehouse.

The traversers were of the surface type, 12 ft. long exclusive of the ramps, and were arranged to travel on three lines of rails. The traverser frame was constructed entirely of steel, and mounted on nine cast steel wheels. The driving gear consisted of two sets of enclosed worm gears

One of the Traversers

driven direct from the motors and provided with an automatic solenoid brake. The return pulleys, situated under the opposite platforms, were fitted with straining and adjusting gear. Suitable means were provided to enable the traverser to be stopped readily in line with the rails on either side. The traversers were capable of carrying loads of 20 tons at a speed of 100 ft. per min., and they were driven by 10-hp. motors, running at 400 r. p. m.

Structurally the warehouse building is of steel, and the floors are constructed of concrete. The danger of fire has thus been minimized but as a precautionary measure, a system of hydrants complete with hose and nozzles has been

fitted throughout the building, and a liberal supply of water buckets and chemical fire extinguishers has been provided.

In addition to the warehouse, which is the outstanding feature of this improvement scheme, extensive facilities have been provided in the yard for dealing with other than warehouse traffic. The general loading platform, capable of accommodating more than 60 cars at one time, is located to the south of the warehouse. A considerable portion of this platform is roofed over, so that to all intents and purposes it forms an extension of the warehouse proper. A 40-ton Goliath electric traveling crane has been provided for dealing with heavy machinery and special loads, while small loads, requiring the use of crane power, are handled by means of hand cranes having capacities of from 5 tons downwards.

The Goliath crane is of the 4-motor type with a span of 50 ft. The height from the floor to the underside of the crane girders is 22 ft., and the length of track 200 ft. The hoisting speed with the full load of 40 tons is 7 ft. per min., accelerating to 14 ft. for light loads, and the hoisting speed on the auxiliary barrel for 6 tons is at the rate of 50 ft. per min. The traveling speed for the full load is 150 ft. per min. and the traversing speed 100 ft. per min. Both hoisting motors are of 31½ hp., while the traveling and traversing motors are of 21 and 6½ hp. respectively. The full load speed of all the motors is 400 r. p. m. The special feature of the crane is that it is provided with one leg only, the end of the crane being carried on an end carriage similar to what is adopted for an ordinary overhead traveling crane.

The crane is driven by a motor fixed in the center of the span of the crane girders, thus giving an equal driving power at each end. The bottom traveling carriage is connected to the cross shaft by means of cast steel bevel bearing enclosed by cast iron covers. The traveling wheels are of rolled wrought steel and have a diameter of 39 in. They are forced on their axles under pressure, and turned on their threads to exact diameters.

A shed has been provided at the east end of the yard for the accommodation of potato traffic. This has a track capacity for 40 cars and ample loading platform space for the handling and sorting of vegetables. Access is had by an entrance from Hunter street.

In order that this new yard and warehouse might be reserved exclusively for merchandise, a new yard, known as Barracks Yard, occupying the site of the old barracks at Glasgow, has been provided for the mineral traffic. Public entrance to this yard is by way of Gallowgate.

This scheme for the improvement of its freight terminal facilities in the city of Glasgow has been in hand by the North British Railway for more than 30 years, the land to the old college warehouse facing Duke street, now taken up by the new building, being acquired in 1875. The design and construction of the plant were carried out under the direction of James Bell, the late engineer-in-chief of the railway company. The contractors were Robert McAlpine & Sons of Glasgow. The details of the electrical plant in the yard and warehouse were worked out by A. W. Stewart, of Glasgow, under whose supervision the various machines were constructed. The electrical equipment of the new warehouse buildings, including the revolving cranes, capstans, 3,000-lb. lifts, and freight car traversers, were constructed by Cowans, Sheldon & Co., Ltd., of Carlisle, England, and the eight 3,000-lb. traveling cranes, the six 3,000-lb. jiggers, and the 40-ton overhead Goliath crane were supplied by Royce, Ltd., of Manchester, England. The writer is indebted to James Calder, general manager of the railway company, for the information given above and for the illustrations.

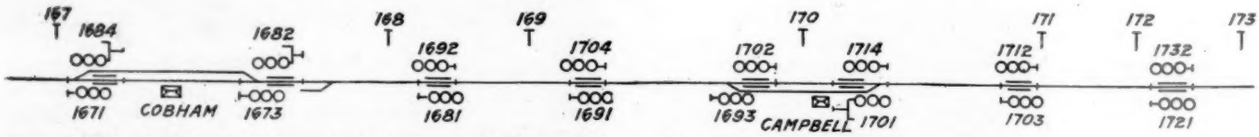
Exhibition of Automatic Train Stop on the Chesapeake & Ohio

BETWEEN GORDONSVILLE and Charlottesville on the main line of the Chesapeake & Ohio on Tuesday, March 25, the automatic stop and cab signal of the American Train Control Company, of Baltimore, Md., was demonstrated before a party of railroad men, bankers and other visitors. This portion of the line is single-track and is operated by the manual block system, but in connection with the installation of the train control apparatus, three-position automatic visual block signals (light signals) have been installed. The track circuits and control wires, as developed by Charles Stephens, signal engineer of the road (and patented by him) are arranged on the "absolute permissive block" plan and the test runs which were made were designed to demonstrate the adequacy of the apparatus for all required conditions.

Ramps for Automatic Train Stop and Cab Signal, Chesapeake & Ohio

Two trains were used, each consisting of a Pacific type locomotive with one passenger car. The first test was to show the behavior of the apparatus in the case of one train following another, the runs being made from signal 1732 eastward to Cobham. The second demonstration was to show the behavior of the apparatus with the locomotive running backward. The third was to demonstrate absolute protection through the block section from meeting point to meeting point.

The fourth test was with two trains running toward each other so timed that they would meet at Campbell. Each



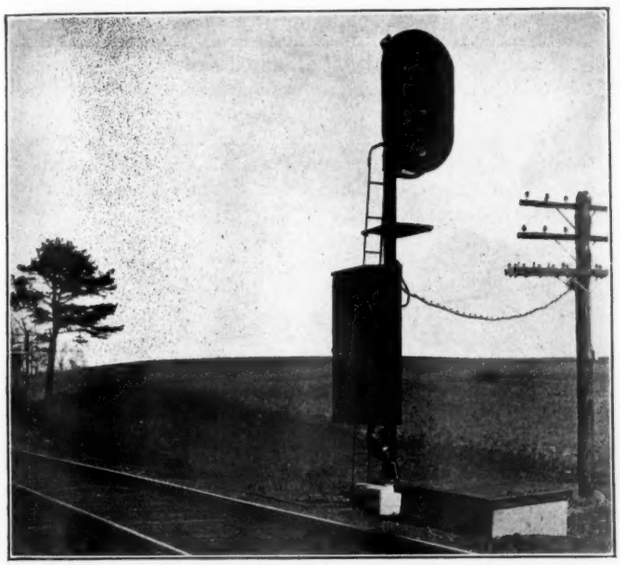
Visual "Light" Roadside Signals; Ramps for Cautionary Visual Indications in Cab, and for Applying Brakes at Stop Signals

Automatic Block Signals, Chesapeake & Ohio

train was instructed to pass the roadside signal indicating stop, at the approach to the passing track at Campbell, and each was stopped by the automatic apparatus at the ramp adjacent to the visual roadside stop signal.

All of the tests went off in satisfactory shape. The length of road which has been equipped aggregates about six miles, and the number of locomotives fitted with the apparatus is 32, half of them freight and half passenger. The system is being extended westward to Charlottesville.

This apparatus was first developed on the Maryland & Pennsylvania Railroad and was brought before the Interstate Commerce Commission in 1907. It was not fully developed, however, until the apparatus was installed on the Chesapeake & Ohio. The first complete tests made on that road were carried out in March, 1916. The committee



Light Signal, Chesapeake & Ohio

appointed by the president of the road to take charge of the matter, drew up a list of requirements, the first one of which was that a satisfactory service application of the brakes should be made, either on a passenger train or a freight, and up to train lengths of 100 cars. In the cab these requirements call for both an audible and a visual signal. Following the tests of three years ago numerous modifications and improvements were made by the railroad company; and the officers appear to be satisfied that their requirements have been met. Tests have been made under service conditions of all kinds and during cold weather. The apparatus has worked well when the shoe on the locomotive was encased in ice, and on three occasions broken rails have been detected.

The system is of the "intermittent contact" or ramp type. The ramp is fixed to the ties 27½ in. outside the gage line of the running rail. On the right hand side of the track all of the ramps are arranged to apply the brakes (when the block ahead is not clear); while on the left hand side all of the ramps are arranged to give only the cautionary indication in the cab. In connection with each three-indication signal, there are two ramps, one on the left hand side corresponding to the cautionary indication of the signal and one on the right corresponding to the stop indication of the signal.

The engine apparatus or "shoe" is fixed to the frame of the front truck of the tender, each ramp causing an upward movement of the "shoe." A battery on the roadside conveys current to the ramp, and, with the ramp energized, this current is carried by the shoe to the apparatus on the locomotive; and by controlling electric magnets it prevents the application of the brakes at the stop ramps and the giving of the cautionary signal in the cab at cautionary ramps. With the ramp de-energized, the lifting of the shoe opens a circuit, de-energizing a magnet; and thus air is exhausted from the train line so as to apply the brakes. The bottom of the contact shoe is in the form of a circular disk, and is arranged so as to make contact even when a little out of line. The ramp rail is of inverted T shape.

Two of the locomotives have automatic AD equipment, 17 have ET 5 equipment, five have combined automatic and straight air equipment, five have New York air brake, No. 6, and three have the ET 6 Westinghouse equipment. The train stop apparatus was connected to all these different designs without difficulty.

A vibrating bell in the cab is arranged to sound whenever the shoe rises as much as ¼ inch, so that the engineman thus receives notice every time a shoe goes over a ramp, without regard to whether the indication is or is not against him. If the vertical movable member of the shoe is broken there is provision made for opening the train line and applying the brakes; if it is bent the first contact with a ramp will tend to cause it to stick in its upward position, thus causing a continual ringing of the bell in the cab. If the shoe should be broken off completely the electrical connections would be broken so as to cause application of the brakes.

To provide for running in either direction and also to provide for using the left hand apparatus in place of the right hand, or vice versa, all of the wires on the locomotive are run through a box containing circuit reversers. Thus in case either shoe is lost or disabled the engineman, by a single operation, can change all of the circuits and substitute either shoe for the other.

The cab signal has a proceed light and a cautionary light, but none for stop; but always on the dropping of the stop valve both lights go out, thus indicating that an automatic stop contact has been made.

After the brakes have been applied the apparatus can be restored to normal position only by lifting the armature of the stop valve; and this must be done by pushing a knob which can be reached only by a person standing on the ground.

The circuits from the engine are fed from an Edison storage battery, B4, of eighty ampere hours capacity. The normal voltage is from 10 to 12 volts, furnished by 10 cells of this battery.

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In this Accident at Weesp in Holland a Dyke Gave Way Because of Heavy Rains and Resulted in 50 Fatalities

The Railroad Problem*

By Walker D. Hines
Director General of Railroads

BY THE GOVERNMENT taking possession of the railroads as a war emergency in December, 1917, three important results were accomplished:

The elimination of conflicting priorities and the unified control of traffic even to the extent of preventing shipments except when they could be disposed of at destination averted serious congestion. Despite the enormous volume of traffic in the fall of 1918 there was practically no congestion and in this respect the condition was radically different from what it had been in previous years. This was of material assistance in the conduct of the war, and prevented tremendous delay and injury to commerce and industry.

In December, 1917, railroad labor regarded itself as grossly underpaid because of the tremendous increase in the cost of living and because of the very high wages paid in nearly every other industry. The demand was insistent for radical increases in wages and improvement in working conditions. No adequate machinery existed to deal with these demands. Suspicion and distrust on the part of railroad labor towards railroad companies was at its high water mark. There appeared no reasonable hope of getting an adequate solution of this fundamental problem without government control. By means of government control and the assurances which were given to labor and later carried out, uninterrupted carrying on of the work in a cordial spirit was assured.

The financial situation of the railroads was most unfavorable. Their costs were mounting rapidly and any possible solution of the labor problems under private management would have created an enormous additional burden. At the same time the difficulties in obtaining corresponding increases in rates were almost insurmountable on account of the different jurisdictions, interstate and state, which had to deal with the subject and on account of the general public distrust of the necessity for substantial increases in rates. This financial situation was restored by government control and the consequent guaranty of adequate rentals.

I believe there will be general assent that these three important objects could not have been adequately dealt with except through government control. But even if there is dissent on that proposition it is still true that government control has become a fact. Moreover, the railroad wages which have been established as a result of the war constitute a fact which will exert a continuing influence upon the railroad situation. Nobody can deny that, broadly speaking, the wage increase and also the eight-hour day would have taken place under any circumstances. Industries under private control were not immune from heavy increases in wages and great improvement in working conditions. These were things toward which the world was moving and the war merely made the world move faster in that direction and brought about in 12 months what otherwise might have taken a longer time.

I believe thoughtful people, no matter what they think about the abstract principles of permanent government ownership, will realize that it was fortunate in the extreme for railroad investors that the government was in position to step into the breach and temporarily stand the shock of this great and inevitable improvement of railroad wages and working conditions.

My appeal is for support and understanding in the vastly difficult task of rendering an adequate public service during the temporary period of federal control. I believe that support and understanding will be forthcoming more completely if the public appreciates the important respects in which the government control promoted the objects of the war and also protected temporarily railroad investors. With these inevitable conditions understood, the way ought to be open for a more friendly appreciation of the earnest efforts which my associates and I are making to discharge to the satisfaction of the public the heavy responsibility temporarily placed upon us. I wish to assure this audience that I am doing all in my power to promote a good and adequate service, and to stimulate efficiency on the part of both officials and employees, and I am encouraged to hope for important improvements in these directions.

Our efforts in this direction are being pressed to the limit of our strength regardless of the embarrassment which suddenly confronted us by the failure of the railroad appropriation. The fact that we are temporarily meeting this difficulty does not, however, mean that the appropriation is not sorely needed, and everyone who has an interest in the welfare of the railroads or in the welfare of the country should support the necessary appropriation so that it will be passed at the earliest possible moment after Congress meets.

Meanwhile the financial situation resulting from the failure of the appropriation is being dealt with as adequately as possible and every effort is being made not to interfere with the industrial and financial equilibrium. Unfortunately the impression has gone out that the Railroad Administration has decided to cut off all improvement work, including additions and betterments and maintenance. This is not a fact. What has happened is that we are taking steps to give the railroad corporations full opportunity to determine whether they should assent to the work which they must finance. It is the intention of the Railroad Administration to carry forward just as much additions and betterments and maintenance work as possible in order that labor may not be thrown out of employment unnecessarily and in order that the railroads be kept in good repair and extended to meet the needs of the situation.

I wish to submit the following suggestions bearing on the subject of a permanent solution of the railroad problem:

I do not believe in government ownership as a permanent policy and I wish to see a policy adopted which will preserve, if possible, the advantages and economies of private initiative while meeting the public necessities for adequate control.

A great many arguments on this subject seem to proceed on the assumption that we have an unlimited choice of methods and that it is easy to find a satisfactory solution. It requires only a little thought to realize that this is not the case. We cannot go back to unrestricted private management and we ought not to go back to a method of regulation that proved unsuccessful. The condition of railroad regulation prior to federal control was so far from satisfactory as to be almost hopeless. This indicates that there was something fundamentally wrong and therefore we cannot expect an adequate solution without fundamental changes.

The object which any successful plan of regulation must accomplish is to attract adequate capital for the great development which must yet be brought about in order to meet the wonderful expansion which the commerce of this country is likely to have. No plan which fails to accomplish this result will successfully deal with the situation. There is no use in urging some makeshift treatment when we are forced to admit that such treatment will fail to accomplish the result.

We cannot accomplish this by resorting to the old method with merely a series of patches put upon the especially noticeable holes which have been worn in it. Under the old method there is the difficulty that no standard whatever is prescribed by which to measure the return to be given upon capital invested in the railroads. The question of return was always subject to dispute. There was no agreement as to the investment, not even an agreement as to a proper rate of return, and what would produce an ample return on one railroad meant poverty or bankruptcy for another. Morover, under the old form of regulation, there was no sufficient contact between the regulating body and the business regulated.

*Abstract of address before the Traffic Club, Pittsburgh, Pa., on March 26.

The managers would see adverse conditions develop and would appreciate the necessity for prompt action. But the regulating body was not in position to have a corresponding insight into the situation and could not act until after the conditions had been developed and then proved in a formal controversy and then argued and briefed and conferred about and decided, and perhaps by that time conditions had begun to change so that the relief which had been badly needed and not accorded might be denied because not still needed for the future. Such uncertainties defeated any adequate assurance to the capital in the railroads. All the conditions favored delay and hesitation and non-action except in extreme cases.

We must not deceive ourselves as to how things worked in the past and as to how they will work in the future unless there is a fundamental change. Consider the public utilities throughout the country. Doubtless in every city the public has a reasonably good intention and the people in office do not desire to destroy the utilities. But there is suspicion as to capitalization, distrust as to the necessity for the expense, extreme hesitation on the part of the people to increase their own expenses by making the necessary increase in rates, and consequently there is non-action. This illustrates in a small way the same conditions which operated in the country as a whole with respect to the railroads. Unless there can be fundamental changes which will change these conditions, there can be no reasonable and continuing assurance of an adequate return for capital.

One of the fundamentals is a standard of return so that the regulating body will have a definite statutory protection for any action taken on this subject. Whenever you get to the point of prescribing a standard of return which must be realized, you have created a sort of government guaranty. To my mind, the great problem is whether to have this guaranty certain or uncertain. Of course the more certain the guaranty, the less initiative on the part of the management. On the other hand, while a less certain guaranty stimulates initiative, it also is less promising to capital and tends to defeat the ultimate objective which is the attraction of adequate capital into the business.

The combination of these great factors is the thing to be accomplished. It is far from easy. It cannot be dealt with by a reproduction of the old conditions with a few palliating amendments. We have got to decide upon how definite we shall make the governmental assurance of an adequate return and how we can accomplish this to a sufficient extent while preserving a sufficient measure of private initiative.

My own view is that a moderate guaranty on capital should be prescribed, so as to give a reasonable assurance to capital; and that there should be a right to participation in any profits made in excess of that guaranty so as to furnish the needed stimulus to private initiative.

I further believe that the government should be strongly represented on the boards of directors and that these government directors should constitute an important part of the regulating body which prescribes the rates so that this regulating body will know as necessities develop that the necessities are developing and will be able to meet the needs of the situation much more nearly at the time the needs arise than is possible at present.

I do not believe these fundamental changes can be successfully carried through except by the construction of a comparatively few great railroad corporations each of which will so combine the prosperous and unprosperous roads as to present a fair average result and get away from the hopeless diversity in earnings which has existed in the past; and upon each of which it will be practicable to have ample governmental representation.

Waterproofing Railway Ties to Preserve Them*

New Method of Treatment Contemplates Thorough Drying and Then Sealing Against Moisture

By H. K. Wicsteed
Chief Locating Engineer, Canadian National Railways

DRY WOODS OR CELLULOSE are almost indestructible by any ordinary agency such as a tie is exposed to. The bacterial growth requires moisture and oxygen for its development. It would appear, therefore, that if we thoroughly dry a piece of timber, and keep it dry, it will last indefinitely. We know from actual experience that this is so. Everyone has used or seen old timber in the form of beams and joists taken from buildings two or three centuries old and perfectly sound. In these cases moisture has been excluded. Again, every one has seen, or at any rate read, of piles and foundation timber many centuries old in a perfect state of preservation. In these cases oxygen has been excluded. We all know that exposed timber will generally last longer when coated with paint or tar or some waterproofing material. The exceptions are where the timber has been waterproofed before it was seasoned, with the effect of retaining the moisture already in the stick and preventing its evaporation. Timber, even when air-dried for a considerable length of time, still contains 15 per cent or more of moisture, the percentage varying with the nature of the material and the size of the stick.

Another point not so well recognized or understood is that seasoning timber increases its strength by as much as 80 to 100 per cent in some cases over that of the green stick. It will be seen at once that, consistent with reasonable expense and loss of time, it is well worth while to dry not only ties, but timber of any kind used as a beam or strut, where strength is necessary. If we increase the strength by even 60 per cent, we require only 62 per cent of the amount of material, and, as this percentage is dry, while the other contains a very large amount of moisture, the saving in freight is very much more than the apparent 38 per cent. In Eastern Canada, at any rate, transportation is a very large item in the cost of our timber and is compelling us, as a matter of expediency, to use steel and concrete where we should use timber if it were readily available.

It being granted that drying or seasoning is extremely desirable, the question is as to the means. In the case of ordinary lumber, air-drying supplemented by a few hours in a kiln is fairly satisfactory. In that of dimension timber this is not so. First, because the air-drying in the case of large sticks takes years to accomplish, because the temperatures used in the ordinary kiln are so high as to injure the strength of the timber; third, because, even when carried on with the greatest care and deliberation, the outside laminae dry first

*Abstract of a paper read before the Canadian Railway Club, Montreal, Canada.

and shrink before the heart of the stick has any chance, and this shrinkage causes checks and cracks which, for many purposes, render the stick useless.

When the "wooden walls of England" were a reality, the seasoning of large sticks was carried on by immersion in sea water for a period of three years, more or less, the saps and resins were dissolved and washed out, and the pores of the wood left open and filled only by water. The subsequent drying was then easily, quickly and uniformly carried on throughout the stick, and the resultant deposits of salt acted as antiseptics just as the creosote does in the modern process. This was perhaps the most perfect seasoning possible, or ever accomplished.

In experiments made in the last two years involving an entirely new process of drying timber an effort was made to use the same process that nature does, and dissolve, neutralize or wash out the sap and other liquids or semi-liquids which obstruct and close the pores, and to do this within a reasonable time, much faster than nature unassisted can accomplish the work. Hot water is more effective than cold water, and hot vapor of water is, in some cases, still more so. In the new process, which is simplicity itself in theory, although the best form of mechanical application took much time and thought to study out, warm vapor, or in other words, warm air, saturated with moisture, is circulated among the ties. This opens and cleans the pores of the wood just as a Turkish bath does in the case of a man. The liquid components of the saps and resins filling the vesicles themselves, expand with the heat and force their way out, to be diluted and carried away by the warm vapor. After some hours of this treatment, the amount of moisture is reduced by very slow degrees, until, at the end, it is practically dry and the timber is removed with not more than 5 per cent of moisture left in it. The rapidity with which this is done depends upon the size of the sticks and the nature of the timber, just as it does in other methods, but no subject has yet been found which did not, in the end, yield to treatment. Care is taken not to let the temperature of the kiln get above 160 deg. F. so that no injury may be done to the fiber of the wood.

Timber so treated is, I believe, indestructible, except by fire, so long as it is kept dry. Even without further treatment, it will undoubtedly long outlast unseasoned material. It is, in this shape, in pre-eminently good condition to receive creosote, but we believe that creosote is absolutely unnecessary and that the elements of decay being altogether removed from the inside, all that is necessary is to keep them from entering the outside. Some waterproofing coating is desirable, and in the case of ties a cheap one is the only one which can be used economically. In the experiments conducted a heavy oil tar was found which is an almost worthless by-product of refineries. The ties were merely dipped in a hot bath of this material for a few minutes and, on coming out, were sanded by a sand blast to absorb any superfluous stickiness and make them easier to handle.

As a result of our experiments with these ties we concluded that they were in the right direction in the main, but that the asphaltic waterproofings were imperfect. They melted and ran under a strong hot sun; and when abraded, as was inevitable in the case of ties, the waterproofing was gone. Some of the more tarry products which penetrated the grain of the wood were much better, and we believe them to be very good.

We are unable to give accurate figures on the cost but estimate it about 30 cents. It may be that this could be brought down, but the cost of the plant would be much higher now than before the war. One of the principal items of cost is for fuel for drying and we all know the price of coal at present. I have some figures of the tests made at Trenton to show the weight of the ties and the amount of moisture that has been absorbed. The whole problem was whether or not we could successfully waterproof the tie and keep it dry. We tried asphalt, also coal tar pitch. We found that the asphalt was useless in many cases. Some poplar ties treated with it are rotten now, but poplar ties that had pitch applied are all right. The pitch has a penetrating quality which the asphalt does not possess. The ties now under test have been over three years in service. After 8 months ties examined had increased in weight about 2½ per cent. The next tie, taken out after 14 months, had been treated with asphalt. It had increased 13 per cent, while two pitch-treated ties taken out at the same time had increased 1½ per cent and 7 per cent. This last was a spruce tie. When in for two years two pitch-treated ties had increased 7½ per cent and 2.9 per cent, while a couple of asphalt-treated ties had increased 14 per cent and 16 per cent, showing the difference in the two treatments.

In November, 1917, one pitch-treated tie had gone up 7 per cent and another 17 per cent, but in this last case there had been a strip of bark left on one side of the tie, which allowed it to become exposed. In May, 1918, one had increased 12 per cent, one 5 per cent and one 10 per cent. In our kiln dried ties the moisture is down to 5 to 8 per cent, so that apparently we have, up to the present, kept most of the ties down below 15 per cent moisture, which we figure is required to even start bacterial action.

The prospect which is opened up by this process is something more than merely getting the equivalent of the creosoted tie at a less cost. It is, besides, the potentiality of using for ties timbers which are now useless for the purpose, or nearly so. The northern birch, for instance, is a strong reliable wood, used by the Indians for every purpose requiring a hard wood, but unavailable for ties or bridge timbers on account of its superabundant sap and its consequent tendency to rot rapidly. The poplar and balsam are others for which there is at present practically no demand. These timbers are particularly interesting to us just now on account of the recent opening up by the railways of thousands of square miles of northern forests, of which, with spruce and jack pine, these are the main constituents. The use of these woods for commercial purposes means millions of dollars to the railways in reduced cost of ties and in freight.

A number of these ties have been put in the Canadian Northern track. Some of them have been taken up and tested for absorption of moisture and for signs of rot. I have one sample of a tie dug up only a few days ago which has been under the track in the Trenton yard for over three years, and I have also another sample of a birch tie which has never been under the track at all, but which shows how perfect the drying part of the process is and what a valuable timber birch is. All of you probably know what an absolutely worthless timber it is if used in outside work without seasoning, and the reason is unquestionably the amount of sap which it contains. If this is dried out and the wood sterilized it is as strong and lasting as most other hardwoods and better than some. It is incidentally the only hardwood in Northern Ontario and Quebec.

The Chamber of Commerce of the State of New York has adopted resolutions asking Congress to have the railroads returned to their owners as soon as it will be safe to do so: to allow private capital to earn more than a minimum in order to preserve the spirit of enterprise, and to provide federal regulation of wages as well as of transportation rates. The resolution recites seven principles which Congress is urged to adopt. The Chamber also went on record in favor of increasing fares on New York City railroads. The Traffic Club of New York city has adopted a resolution disapproving government ownership, management or operation of railroads, and has sent copies of it to traffic interests throughout the country.

Railway Supply Industry and the Railroads

What the Railway Supply and Equipment Companies Have Done to Improve Railway Operation

A UNIQUE and interesting program was provided at the March 21 meeting of the New York Railroad Club. An innovation was introduced in the form of an opportunity for the "Railway Supplymen" to tell what they have done and are attempting to do in improving the service and efficiency of the railways. Abstracts of the papers presented follow:

The Work of the Supply Engineer

By W. E. Woodard
Vice-president, Lima Locomotive Works, Inc.

Any attempt adequately to review the contribution of the engineers of the railway equipment and supply companies to the railways of the country leads into all branches of engineering activities. Engineers and specialists in every line have aided in the wonderful advance of the past few years, from the steel makers, who have worked upon the problem of improved rail production, to the electrical engineers who have given us electrical locomotives, train lighting, signal apparatus, and even train wireless. One single development alone, that of the air brake, has been so far-reaching in its influence that the steps in its evolution and perfection have very largely controlled progress in heavier trains, larger locomotives and higher speeds.

Steel car developments have come so quickly and so far as the general public is concerned, with such apparent ease, that the vast amount of engineering work involved is apt to be overlooked. With it came electric car lighting, a noteworthy development in itself, the introduction of rolled steel wheels, the all-steel car trucks, vestibules, and improved brake beams and shoes.

The debt of the public to the art of railway signaling is almost equal to that it owes to the air brake. Signaling has more than doubled the capacity of many roads in this country, to say nothing about the element of safety. A signal engineer of wide experience has said that the Grand Central Terminal without interlocking and signals would require ten times the number of tracks it now has simply to accommodate the traffic without any consideration of the safety element.

No branch of railroad engineering has had a more noteworthy advance than that of locomotive designing, and probably a greater number of individual organizations contributed to the results than in any other single field of railroad work. This development is the best example of a group of supply and equipment companies working together to refine and perfect one of the most essential elements in railroad operation. To the locomotive builder belongs the credit for improved designs and increased capacity of locomotives as a whole. To them is also due the credit for starting some of the improvements made for increased capacity and for improved economy. But to the supply concerns is due a larger degree of credit for the patience and courage which has been required to put many individual improvements in the position which they now occupy. A review of the advance in locomotive building will show that the engineering work of the builders has been most closely related to and dependent upon the engineering activities of the supply and equipment companies.

In certain lines entirely new developments have been projected and carried out by the supply and equipment companies, as for example, the locomotive stoker, and the use of pulverized fuel. Thus we have come to see the supply and equipment companies no longer simply building and selling accessories, but occupying a much broader and more important field. Some of the railway supply concerns have spent enormous sums of money to build up fine engineering organizations, with a view not only to refine their developments to the highest degree, but also to forward the art from an entirely scientific standpoint. There is a question whether the public appreciates the spirit and energy back of the majority of these large supply companies. Both the builder and the supply companies have been working toward one end: increased safety of operation; improved efficiency and greater capacity for our locomotives.

A measure of what has been accomplished is a history of locomotive developments in the past few years. Weights of typical passenger locomotives have increased 50 to 75 per cent since 1900 and freight engines in about the same proportion. Such advances would have been out of the question had it not been possible to have taken advantage of engineering developments effecting increased economies which have more than kept pace with the increase in the size of the engines. Perhaps it would be more accurate to say that the engineering developments in the past few years have effected such economy of operation as to make possible these increases in size. This is the real measure of the advance; it is due to the combined engineering experience and work of the supply and equipment companies and locomotive builders.

Let me illustrate my statement by some test plant figures obtained from a good design of Consolidation locomotive of about 1904, and a modern design of Mikado locomotive built in 1915. We may regard 5,000 pounds of coal an hour as about the limit of a fireman for continuous work—I will take this as a basis for comparison. The Consolidation required 4,700 pounds of coal per hour to obtain an output of 1,050 hp. and this was about the limit of the engine. With the same amount of coal, the Mikado engine produces 1,900 hp. These are actual test plant figures, but the everyday experience of the railway men bear them out. It is because of this that railroads recognize that it pays to scrap light and obsolete locomotives or to reconstruct them on modern lines, using the refinements and developments which have brought about these improvements.

This class of developments can be grouped under three general heads: Improvements affecting the combustion of the fuel, steam generation, and cylinder performance. The improvements under these heads are as follows:

COMBUSTION OF FUEL.

Introduction of wide fireboxes with grate areas sufficiently large to keep the rate of combustion within economical figures.

Provision of proper air openings into the ash pan—an item which was for many years given little attention, but one of vital importance.

A better knowledge of the principles of combustion which has led to the wide use of the brick arch and the proper proportioning of combustion spaces to grate area, the latter item involving the use of combustion chambers.

Better draft conditions largely made possible by the use of outside steam pipes, which came in with the superheater.

Improved front ends, stack and nozzle designs.

STEAM GENERATION.

Greater care in proportioning boilers to suit the cylinder horse power. The boilers of many older locomotives under normal operating conditions were overtaxed and were consequently inefficient.

Improved design of water spaces which insure good circulation of water in the boiler, in which result arch tubes are a material help.

A better understanding of the relation of tube lengths to diameters which has eliminated inefficient tube heating surface and promoted the use of combustion chambers.

Feed water heating, which is just now being introduced upon locomotives, the saving from which is not included in the test figures mentioned above.

CYLINDER PERFORMANCE.

Superheating, the most important single element in the list.

Mallet locomotives.

Superheating aided very materially in bringing Mallet locomotives into favor.

Valves and valve motions.

Better proportions of steam and exhaust passages, particularly the latter.

The importance of these improvements is evident by the following figures taken from the same engines as mentioned above. For every 5,000 lb. of coal the boiler of the typical Consolidation of 1904 delivered to the cylinders 26,000 lb. of steam. The Mikado locomotive, for the same amount of coal delivered 38,000 lb. of steam. The Consolidation locomotive, to develop 1,500 hp. in the cylinders, required 26,000 lb. of steam per hour, whereas the Mikado developed the same horsepower with only 19,000 lb. of steam.

Even with these improvements there was a well defined limit to locomotive capacity set by the physical limitations of the fireman. The stoker and pulverized fuel gave the answer. Both of these developments have had and will have a far-reaching influence on locomotive designs. They have made possible sizes of locomotives not thought of before their introduction. At no distant date the importance of pulverized fuel will become more evident as this country is forced to practice greater coal conservation.

Locomotives having a tractive power of 147,000 lb. compound and 176,000 lb. simple have been built and several designs are in operation in road service having a tractive power of over 100,000 lb. Such work calls for coal, the demand at times running as high as 12,000 lb. per hour. Locomotives of the latter class are hauling 3,100-ton trains over a division of 113 miles having 1.2 per cent grades at an average running speed of 18.7 m. p. h. These figures prove better than any amount of argument the vital importance of the stoker on locomotive design and the possibilities of pulverized fuel.

Along with these developments, directly affecting economy of operation and increased capacity, comes another class of improvements of no less importance, i. e., those which aim at increasing the safety and ease of operation and reducing the maintenance. Many developments in this class also more or less directly improve the economy of operation. For example; power reverse gears which permit the engineman easily to adjust the cut-off at any speed, while with the old style of reverse gear he would not dare to make a change. Also, automatic firedoors and grate shakers contribute directly to improving the firing conditions and thus promote the economy of coal. In the safety class of developments may be mentioned electric headlights, improved connection between engine and tender, flexible stay-bolts, bell ringers, low water alarms, water glasses and improved cab fittings. In the class directly affecting maintenance are improved lubrication for cylinders and journals, self-adjusting driving box wedges, throttles, drifting valves and the application of cast steel parts. The use of cast steel has been extended to cover many elements in the locomotive which were previously built up of a number of parts. For example: truck frames, both engine and tender, engine frame cradles, tender frames and bumpers, and even the two main engine frames have been made in one casting. Cast steel cylinders were produced some time ago. This extended use of cast steel is not only working toward the betterment of maintenance on account of the reduction in the number of parts and connections, but also means a saving of weight. Every pound of material which can be taken out of the running gear goes into the boiler where it is of the maximum use.

In about 1900 apparently the limit of permissible rigid driving wheel base had been reached and progress by the addition of driving wheels seemed stopped. This was met in two ways: by the articulated locomotive and by the lateral motion driving box used with engine trucks capable of large displacements, but with sufficient resistance properly to guide the heaviest engines.

Thus one by one limitations have been removed, and one by one new elements effecting economy of operation, promoting safety or reducing maintenance have been introduced.

To some the commercial side of these developments may seem to have obscured the engineering side but without the spur of competition and the possibilities of a fair recompense the results would never have been obtained. The same is true of every great industrial development and does not detract from the engineering significance of what has been done. The same is true of railroad building.

In the light of what has been accomplished, what are to be the future developments? I have already mentioned the possibilities of pulverized coal, but in addition to the economic side it permits of certain design developments not possible with coal fired locomotives. The firebox can be placed over the drivers, the ash pan space reduced and a driving wheel arrangement secured which for coal-burning engines would be unsatisfactory if not entirely impracticable. In the matter of boiler capacity, we have available the economy which the feed water heater offers by its conservation of heat that is now wasted. We will always have limitations of wheel loads, but so far as driving wheel loads are concerned there are certain possibilities which so far have only been touched. These limitations have always been stated in terms of the allowable static weights, without reference to the effect of the rotating and reciprocating parts due to speed. This question is beginning to receive some of the attention which it deserves, and enough has already been done to show that we can materially increase the power of the locomotive by the use of reciprocating and rotating parts, and still keep the dynamic weights within the limitations which now obtain. Ten per cent increase is a conservative figure for heavy freight locomotives. Consider what this means in increased capacity of locomotives and in conservation of track and bridges.

The railway companies have contributed much to these developments, broad-minded and far-seeing railway men have pointed out the requirements to be met. They have given their time and facilities for experiment and trial, but the major credit is due to the inspiration, the perseverance and the courage of the men who kept pushing the developments on to the point where the railways of the country have seen their importance and could not afford to be without them. They had to meet discouragements and sometimes even opposition, but they never lost faith in what they were striving to accomplish for the betterment of the railways. These men say little about obstacles, about discouraging years and about the almost superhuman efforts which were required to bring a new idea to fruition.

What have been the impelling forces back of these improvements? The absolute need on the part of the individual railroad companies to meet the increasing transportation demands of the country and not "go broke"; on the part of the supply companies, a group of men of highly specialized experience, many of them with railroad training, who are devoting their lives and energies to aid in the solving of these problems. Are the advances to stop because of the lack of incentives or because the demands for economy from the railroad companies may not be so insistent as in the past?

The situation requires a broad-minded, clearly defined policy which will encourage the trial of new devices, the perfecting of those under development and will justify venturing the money which is needed.

New conditions confront the transportation interests of the country. The help of the same men who have been active in the developments of the past is needed now as never before. They have contributed brains, time and money to the art of railroading. Their contributions should be recognized and acknowledged and the same relations between the railroads and the supply companies which have produced the developments of the past should be continued and greatly strengthened. In this way only will the experience and energy of these men be made fully available in solving the problems of the future.

In the opinion of your speaker the steam locomotive has not by any means reached its limit of capacity or economy. The wonderful improvements of the recent past themselves suggest further possibilities that will put past and present achievements in the shade. Like a deposit in a strong bank these prospective improvements lie ready to hand. These are the means wherewith to meet the transportation problems of the future, the like of which have never before been faced.

The Consulting Specialist and Service

By A. L. Humphreys

Vice-president, Westinghouse Air Brake Company

Prior to the opening of the War in August, 1914, the railroads of the United States were able to demonstrate, and had demonstrated for many years, their ability to operate at a lower cost per ton mile than the railroads of any other country in the world. It is with this enormously important fact that I wish to begin, for beyond any question the low cost of transportation which prevailed prior to the war—an economic fact of the greatest influence and value to every business interest in this country—was largely the result of two factors. First: railroad managers of enterprise and ability, with vision, initiative and courage, on the one hand; and, second, the tireless energy, persistence and understanding of conditions limiting development on the part of the railroad man's greatest ally, the so-called railroad "supply-man."

In analyzing the problems that attach to railroad operation, we touch upon more principles vital to our national prosperity and we influence and affect a larger proportion of the population than in any other line of business activity—agriculture alone excepted. Successful railroad management and operation is a complex and highly specialized business in itself, requiring long experience, training and skill. It has been true always, but more so today than ever before, that railroad officials have full use for all their resources of mind and body to carry the responsibilities arising exclusively in connection with freight and passenger traffic handling. But a thousand separate and independent arts and sciences enter into, and are absolutely essential to, the most successful solution of railroad problems.

Nothing is more striking than that business and human activity in every form grows constantly more complex—and with a larger and more intensive specialization. The natural and inevitable result is—and this has been emphasized in recent years—the physical impossibility of the railroad man acquiring on his own account the same detailed specialized knowledge, practical experience and research information that the manufacturers possess in their respective lines of business.

If this conception of the situation is accurate, it follows absolutely that if transportation efficiency in this country is to continue to lead the world as was the case prior to 1914, there must also continue to be a comprehensive and far-reaching appreciation on the part of both the railroad man and the supply man of their mutual and reciprocal functions and responsibilities in improving railroad practice, railroad service, railroad costs, and railroad revenues. On the one hand we must have the trained, skilled, experienced and specialized railroad man, and on the other, the trained, skilled, experienced, and specialized railroad supply man, or manufacturer, whose part is indeed that of the "Consulting Specialist."

There is in fact no department of railroad work to which the consulting specialist has not contributed large value, and my experience as a railroad executive for long years has convinced me that the railroad man of understanding and vision, wide-awake and alert to the utmost possibilities of his opportunities, has been first and foremost to take advantage of what the consulting specialist has to offer as applied to his own local conditions and the first to express his appreciation and to encourage the specialist to further progress in his line.

Speaking from the standpoint of the consulting specialist—may I mention a few of the concrete forms of service rendered the railroads:

Wheels: One of the most important evolutions in railroad practice during the past 20 years has been to produce cast iron and steel wheels capable of standing up under tremendously greater loaded car weights, when subjected to heat developed from brake shoe friction on long mountain grades.

Brake Shoes: A vast amount of research and endless experiments have been made by manufacturers of brake shoes. The making of brake shoes, simple as it may appear to the uninformed, is a fine art requiring a precision of process few appreciate, to produce shoes for different brake pressures and service conditions.

Air Brake and Block Signals: The development in these two separate but related arts has gone far to expand old limits of operation, referring particularly to traffic density. Economy of operation and safety in handling life and property are insured by modern braking and up-to-date block signal equipment, entirely beyond what was previously possible. A hint of what is involved in the art of braking, for example, is contained in the simple statement that acceleration of a heavy railroad train from rest to 60 m. p. h.—in about six minutes of time—is due to an enormous flow of energy (from heat to motion). The modern brake is required to return this train to rest in 20 *seconds.* To do so, the flow of energy, from motion to heat, *must be eighteen times faster.*

Superheaters: In recent years the rising cost of fuel has led to the development of superheaters by which locomotive horsepower is materially increased for a given fuel consumption. The fuel bill for the railroads of this country is the largest single item of expense and second only to the cost of labor. Savings possible by the use of superheaters are therefore enormous in the aggregate.

Automatic Stokers: This is another illustration of a development which has contributed largely to railroad tonnage capacity through ability to develop the maximum tractive power of the locomotive.

I have selected these particular illustrations, out of many, chiefly to show the inter-dependence and inter-relation of many separate developments. Wheels make possible modern large capacity cars; superheaters increase locomotive horse power per unit of fuel consumption; mechanical stokers insure maximum capacity of the locomotive as designed; both are required to haul long trains of heavy cars—freight, and at high speed, passenger.

The necessity of co-operating with the railroads on some *systematic* basis has brought about naturally and inevitably the organization of service departments by some of our larger consulting specialists. These departments are made up of men trained in the particular business in which they are

engaged, with duties confined to inspection, analysis, the study of service conditions, suggesting and developing ways and means for improvement, and in general by a close and specialized study of railroad problems, demonstrating to the railroad man how to make the most efficient use of his equipment in service. The possibilities that attach to a properly trained and organized service department are without limit as to the value to the railroad.

If you will pardon what may appear to be a personal reference—but mentioned by way of illustration simply because it is the field with which I am most familiar—I would refer to some of the activities of the service organizations of the companies with which I am connected.

Organization. The companies to which I refer have developed an organization of trained specialists who are not only thoroughly familiar with designs and construction, but who are experienced in the very much larger and more important problem of the practical application of the apparatus we manufacture to the control of moving trains. The value of this organization to the railroads lies not alone in the fact of their long and experienced training in an important industry and art, but in the ability to assist the railroads in securing the most efficient and therefore the most economical results possible from train control as accomplished by the air brake and kindred devices in both freight and passenger service. The personnel of such an organization—and this is true of any properly developed service department—must not only include a scientific and expert practical knowledge of the business concerned, but must have the further vital faculty of being able to teach others and to secure a friendly interest and co-operation in attaining the results desired.

It is, I believe, permissible to state that this organization is not commercial in any sense; that is to say, the specialists attached to the service departments do not approach their problems from the commercial point of view, but primarily and first of all on the basis of the facts involved and what can be accomplished by scientific or mechanical ingenuity to improve conditions.

Laboratory and Experimental Equipment: In any engineering organization that is a pioneer in a particular field, a very considerable element of expense is involved in laboratory and experimental organization and equipment. The facilities comprised in this division of our organization are both directly and indirectly at the service of the railroads; that is, directly in that individual inspections, demonstrations and tests can be made at any time by arrangement; and indirectly, because the invention and development originating in this department are adding betterments constantly to our product as a whole.

Field Equipment: The service department of the companies to which I refer also includes, as an extension of these other divisions of the organization, special forms of service; as, for example:—

(a) An instruction car completely equipped with brake apparatus and related devices and arranged for the purpose of instructing railroad employees, not so much in the details of construction, but in the broad principles of train handling; to avoid break-in-twos; to eliminate damage to rolling stock and lading; to get trains over the road on time, etc., etc. This instruction car has been over practically every railroad in this country—and on many roads more than once—and is credited with a record of 150,284 miles travelled and nearly 400,000 railroad employees instructed.

(b) A dynamometer car completely equipped with the most intricate and modern apparatus for recording stresses in buff and stretch; drawbar pull; brake pressures and action in both application and release; and other information invaluable to the railroad man who is making a scientific study of his own particular conditions. This car has been used in developing data and establishing proper tonnage ratings for locomotives on many of the leading railways of the country.

Instructions: Not the least important work of our service organization as distinguished from the commercial side, is the division devoted to the preparation of printed instruction matter, isometric diagrams, charts and other guides to the study of equipment and the proper use of such equipment in service. Prior to 1914 the practice was becoming general on the part of the larger roads of issuing instruction matter in their own way and under their own authority. In this, our educational division has collaborated to such extent as desired by the railroads.

Government control of railroad operation has of course brought changed conditions in many respects. Whatever else may be said by fair minded critics, we believe temporary government operation during the war period has resulted in benefit in the direction of emphasis on standardization, on simplicity, on the value of interchange, on the necessity of co-ordinating not only the efforts of the railroads themselves, but the relations to the railroads of the army of consulting specialists. The world war was won by unity of purpose and co-ordination of material forces, and present railroad problems will not be solved satisfactorily until and unless the railroad man and the consulting specialist combine and co-operate as in the days of the past; and every education of all of us along that line, every written article, every meeting of this kind, cannot fail to be helpful and constructive in the direction desired, and which is important not only to the railroads, not alone to the business of the consulting specialist, but to our whole people.

Irregularities in Rate of Purchasing Equipment

Dr. W. F. M. Goss, president of the Railway Car Manufacturers Association, spoke of the difficulties encountered by the railway equipment manufacturers because of the unscientific way in which railway purchases are made. The railways flock to the market in times of prosperity and in times of depression orders for equipment very materially decrease. He referred to this particular feature as waves of business and illustrated the amplitude of these waves by saying that, considering the crest as 100, the trough would not amount to more than 30. Such fluctuations in volume of business disrupt the organization of the manufacturers and greatly affect the employment situation. It is a case of feast or famine, and under such conditions maximum efficiency in equipment manufacture cannot be obtained.

The car and locomotive builders are primarily assembling concerns. The ramifications of the business are extensive and many industries draw from the equipment manufacturers. Therefore variations in rates of purchase not only affect the companies directly related to the railroads, but all the allied industries, such as steel manufacturers, lumber merchants, etc. Doctor Goss emphasized the harmful effect of all this on the development of business, on the relations to labor, and on the educational and social service that every employer should supply.

While it is difficult to suggest a remedy for this irregular flow of business, Doctor Goss said there are some constant factors that have a very large bearing on the subject. The two most important factors are depreciation and increased needs of the country. It has been found that in the neighborhood of 100,000 freight cars must be built each year to make good the depreciation losses and, further, that there is a need for new cars each year to meet the increased demands of the country. While it is hard to say just what number of cars will take care of this increased demand, it is believed to be between 100,000 and 150,000 cars per year. Inasmuch as both of these factors are constant and have become fairly well established, it is easy to determine that there should be a demand which would average, say, 16,000 cars per month. If it were possible to let the car manufacturers

proceed with the construction of cars at this as a minimum program, it would do much to improve working conditions. It would permit greater efficiency in the operation of the car building plants and the allied industries and it would maintain the organizations of these industries in effective operation, so that any sudden increase in demands could be well taken care of. It is to be hoped, he said, that with changed conditions some solution of the problem will be found in order to accomplish these ends.

Discussion

W. G. Besler, president and general manager of the Central Railroad of New Jersey, said railway men should be willing to give credit and praise to the railway supply men for what they have done to improve and investigate methods for more efficient railroading. They have done a great deal to improve railroad conditions and the more progressive roads have likewise been of great assistance to them in trying out their devices in actual service. He said that the railway supply companies have done all that the speakers have said and more; they have spent a large amount of money in developing their particular devices, and in a number of cases only to find their inventions or materials impractical for railroad use. In commenting on the cycles of depression and prosperity in the supply business he said that this was common to all industries. When the roads needed equipment, business was good and they had money to spend, and many times when they did not need equipment they did not have the money to spend. Those roads that could spend money in times of depression made some very profitable purchases, as the equipment companies were glad of the opportunity to keep their organizations together and their shops going. He spoke particularly of the Philadelphia & Reading and the Central Railroad of New Jersey as having followed this practice.

Doings of the United States Railroad Administration

Director General on Trip of Inspection—Issuance of Certificates of Indebtedness Begun

WASHINGTON, D. C.

DIRECTOR GENERAL HINES and several members of his staff left Washington on March 25 for a week's trip of inspection over several railroads and for conferences with the regional and local officers at Pittsburgh, Chicago and Atlanta. Mr. Hines addressed the Pittsburgh Traffic Club on Wednesday and was to reach Chicago on Friday. He was accompanied by W. T. Tyler, director, and Frank McManamy, assistant director, of the Division of Operation; Edward Chambers, director, and Gerrit Fort, assistant director, of the Division of Traffic; W. S. Carter, director of the Division of Labor; Max Thelen, director of the Division of Public Service, and Brice Clagett, assistant to the director general.

Certificates Issued for April 1 Requirements

Certificates of indebtedness of the Railroad Administration have been issued this week to the railroad companies for part of what is due them on account of rental and other transactions arising out of federal control sufficient to take care of the April 1 requirements of the companies for interest, dividends and other corporate needs. On the security of these certificates the War Finance Corporation is making advances to the railroad companies payable at the Federal Reserve Bank at New York on demand notes of the railroad companies at 6 per cent for 80 per cent of the face of the certificates or 100 per cent if acceptable collateral is added for the amount of the difference, and a number of roads were expected to receive their money on Thursday. This is in accordance with a plan announced by Director General Hines after a conference with the committee representing the Association of Railway Executives on March 20. The April 1 requirements are estimated at approximately $70,000,000. The certificates are payable "when and as soon as the director general shall have funds available."

Applications amounting to something over $44,000,000 had been received by the Railroad Administration from railroad companies up to March 21 and additional applications were made from day to day this week as the necessary formalities were complied with. Up to Wednesday certificates had been issued to the Boston & Maine for $910,000, the Nashville, Chattanooga & St. Louis for $250,000, the Philadelphia & Reading for $500,000, the Maine Central for $312,000, the New York Central for $2,500,000, the Missouri Pacific for $1,400,000, the Atchison, Topeka & Santa Fe for $6,625,000, the Northwestern Pacific for $675,000, Western Maryland $1,165,000, Washington Southern $100,000, Richmond, Fredericksburg & Potomac $180,000 and Chicago, Burlington & Quincy $4,972,000. Certificates were ready to be issued to the Lake Erie & Western for $78,000, Cleveland, Cincinnati, Chicago & St. Louis $425,000, Michigan Central $1,240,000, Great Northern $480,000 and Erie $3,125,000. In addition, applications had been received from the following roads:

Chesapeake & Ohio for	$1,000,000
Alabama & Vicksburg	200,000
Bangor & Aroostook	475,000
Colorado & Southern	177,000
Lehigh Valley	3,125,000
Minneapolis, St. Paul & Sault Ste. Marie	510,000
St. Louis, Brownsville & Mexico	475,000
Southern Pacific	7,875,000
Ocean Steamship Co	138,000
New England Steamship Co	313,000
San Antonio & Aransas Pass	67,000
St. Louis-San Francisco	1,875,000
Perkiomen	280,000
Central of New Jersey	969,000
Buffalo, Rochester & Pittsburgh	261,000
Georgia Railroad	388,000
Chicago, Milwaukee & St. Paul	2,000,000
Vicksburg, Shreveport & Pacific	197,000
Mississippi, Louisiana Railroad & Transfer Co	52,000
Wheeling & Lake Erie	773,000
Baltimore & Ohio	5,750,000
Chicago, Rock Island & Pacific	3,332,000

The matter of preparing applications, resolutions to be passed by the directors of the various railroad companies, and information as to obtaining certificates from the director general of railroads is in charge of Alfred P. Thom, secretary of the railroad executives' committee. A form of certificate which is acceptable to the War Finance Corporation was prepared by Alfred A. Cook, Esq., special counsel for the War Finance Corporation, and this form has been approved by the railroad committee and by the general counsel for the director general. A statement issued by the War Finance Corporation said in part:

"As each application is presented to the War Finance Corporation it will be considered by the directors of that corporation upon its merits and in strict compliance with the provisions of the War Finance Corporation act as to adequacy of security, margin of security and in all other respects. The policy of lending money to railroads is by no means a new one for the War Finance Corporation. As early as March, 1918, when the bill to create the War Finance Corporation was pending in Congress, the Secretary of the Treasury, Mr. McAdoo, expressly pointed out in his

testimony before the committee that loans to railroads would be among the functions of the War Finance Corporation. In fact, section 9 which was passed on April 15, 1918, expressly contemplates that advances will be made by the War Finance Corporation to railroads while in the possession and under the control of the President. In pursuance of this authority the War Finance Corporation, beginning with the autumn of 1918, began to lend money on a large scale to railroads on their offering of adequate security, and in this way a material part of the War Finance Corporation was engaged in railroad loans, even before January 1, 1919.

"The policy, therefore, which is now being pursued in loaning funds for the operation of railroads is entirely in line with the original intention of Congress, as expressed by the statute, and also in line with the settled procedure of the Finance Corporation throughout the course of its brief history. The number of applications from railroads for advances has been greatly augmented by the failure of Congress to provide the appropriation asked by the director general just before the adjournment of Congress."

The form of application states that the advance is required for the purpose of enabling the company to meet its obligations and other pressing corporate needs in amounts approved by the director general of railroads, that the railroad company is unable at this time to obtain the funds requested on reasonable terms through banking channels or from the general public and the railroad company agrees to repay the advance as soon as it can obtain funds elsewhere on reasonable terms without any demand for payment by the War Finance Corporation. The form also states that any and all sums that shall be paid by the director general upon or with respect to the certificate are to be collected by the War Finance Corporation and applied by it in reduction of the principal; also that the War Finance Corporation shall have the right to sell the certificate through banking channels or in the general market at its option, at not less than the principal amount and accrued interest, retaining from the proceeds an amount sufficient to pay the principal of the note and paying over any excess to the railroad company and delivering to the company the collateral remaining, if any. A certificate of approval of the director general is appended and the statement also includes a form of resolutions of the executive committee or board of directors of the company.

The instructions to the railroads for filling out applications for advances were as follows:

"The company should if possible give as security certificates to the principal amount of 125 per cent of the sums requested as an advance. If certificates to the amount of 125 per cent of the advance requested are not available, the balance should be supplied by additional collateral, preferably in the form of bonds or other securities with a quoted market value, so as to make the total collateral worth, accepting the certificates at par and the additional collateral at market value, 125 per cent of the advance desired.

"Market value should be construed as the latest bid price, or in the event of recent sales, one or two points under the last sale. In case securities without quoted market are offered, the estimated value based on market quotations for securities of similar character should be given.

"The additional collateral furnished by the company should be worth not less than the price used in valuing it, and the belief of the company as to such worth must be stated.

"Applications and resolutions of the board should be filed in triplicate."

The question of meeting the further requirements of the railroads after April 1 needs have been met will be considered later and consideration is still being given to the details of the methods to be adopted for meeting obligations due from the Railroad Administration to the equipment companies by the use of trade acceptances. No announcement on this subject was made by Mr. Hines before he left for a western trip Tuesday evening, and the committee representing the equipment companies is still negotiating on the matter with officials of the Division of Finance and with the specialty and material companies, some of whom are understood to have expressed some reluctance to receiving their pay in acceptances from the Railroad Administration, with which they had no contracts, instead of in cash from the equipment companies who had the contracts.

The cash situation of the Railroad Administration has been materially improved by the receipt of $10,000,000 from the Navy Department and $100,000,000 from the War Department on account of bills for freight and passenger transportation and by the loan of $50,000,000 from the War Finance Corporation. This money is being apportioned by the Railroad Administration among the federal treasurers and will put them in a better position to meet their current bills, with some of which they had fallen behind.

The Railroad Administration has as yet displayed no activity in the direction of entering the market for rails or other steel products in spite of the agreement reached between the Industrial Board of the Department of Commerce and the representatives of the steel industry on reduced prices for steel. The theory of the agreement was that prices should be fixed which should apply to purchases by the government and set a precedent for general application but the Railroad Administration, which represents the largest consumer of steel, is not in a position to do much toward starting a buying movement. T. C. Powell, director of the Division of Capital Expenditures, was a member of the Industrial Board which accepted the revised steel prices and presumably consented to the price fixed for rails, which is $10 a ton less than that of last year, but $10 a ton above the prices of the last railroad orders. It has been understood that the Railroad Administration would at least place an initial order for 500,000 tons and the matter is under consideration but no decision has been announced.

Progress Toward Restoration of Normal Conditions

Considerable progress has been made in many directions by the Railroad Administration in restoring the transportation service to the normal basis which existed before the war. The most noticeable changes naturally are in the way of increased and improved passenger service, because during the war it was necessary to subordinate the comfort and convenience of passengers to a considerable extent to the demands of the freight traffic. In his testimony before the House Appropriations Committee in February, Director General Hines stated that since the armistice was signed it had been the policy of the Railroad Administration to try to get the service back to normal as to convenience and adequacy, the purpose being to meet the necessities of the situation. While the purpose still is to view the operations as a whole, he said, and to try to get the best results, it is necessary to give more consideration to what is done on a particular railroad than during the war period. Also, he said, realizing the probability that in the reasonably near future the railroads may go back to their owners, the administration is endeavoring to pursue a policy of considerateness so as not to needlessly interfere with the sort of traffic that would be handled by the corporation if it were in control of its own lines.

The statistics published in last week's issue of the *Railway Age*, comparing the net operating income of the railroads in 1918 with the standard return representing the net operating income for the three years before the war, indicated some marked changes in the volume or character of the traffic of many roads after they were taken over by the government, although a part of the difference between the results for 1918 and those for the pre-war period must be

attributed to increases in expenses. Apparently the Railroad Administration, while not taking active steps to restore to a railroad traffic which might have been diverted from it during the war period, is doing little in the direction of further diversion and is rather letting the traffic follow its own channels. At the hearing a question was addressed to Mr. Hines as to whether the shippers are being left free in the matter of routing their freight. C. A. Prouty, then director of the Division of Public Service and Accounting, who was present, was called upon to answer the question and said that theoretically they are not, but as a practical matter in most cases they are.

While the Railroad Administration has announced no change in the instructions to route freight by the most direct routes, it is understood that shippers are being given more discretion than they were last year as to the routing of their freight and where a preference is expressed it is not interfered with except for some special reason. The volume of export traffic is now in some cases greater than it was during the war and it is still necessary to exercise supervision to prevent congestion. Mr. Prouty said that usually all the shipper asks is a certain terminal delivery and when that is given he is usually satisfied. In some cases, as in the routing of perishable commodities, such as vegetables, citrus fruits, etc., from Florida, the shipper has insisted on routing the traffic through a certain Ohio river gateway and in one case that was denied. Subsequently, the subject was reconsidered and the shipper was given the privilege. In some instances the fact that terminals have been unified has made it unnecessary for the shipper to route by certain lines in order to secure the desired terminal delivery. A number of roads that formerly increased their proportion of the traffic by solicitation have lost traffic by the discontinuance of solicitation to some other road and many railroads apparently are worrying as to the condition they would be in if the railroads were restored to their owners without any steps having been taken to restore the former traffic conditions, because after shippers have acquired the habit of routing in a certain way great efforts would have to be exerted by some roads to recover the traffic which they had enjoyed under the former competitive condition.

The reduction in the amount of expedited traffic required for war purposes has of itself restored more normal conditions in the freight service, particularly as to the service accorded to kinds of frerirght which were classified as non-essentials. Many of the restrictions formerly enforced by the embargo and permit systems have also been gradually withdrawn, as has the zone routing system for coal shipments. In the passenger service the principal change in the direction of the restoration of normal conditions has consisted of putting additional trains in service, restoring observation, lounge and club cars, and increasing the amount of service to winter resorts such as Hot Springs and Florida. A limited campaign of advertising for winter tourist traffic was inaugurated on January 1 and the director general recently announced the intention to engage in a limited advertising campaign in newspapers and national magazines for the purpose of promoting travel to the national parks and principal health and pleasure resorts. This will be accompanied by the restoration of reduced summer tourist rates to many points where they were not in effect last year. The a la carte dining service was restored on a large number of trains in various parts of the country during the month of March replacing the table d'hote service which was put into effect as a war measure. The use of special and private cars which was discontinued during the war has again been permitted and the minimum requirement for a special car has been reduced from 30 to 25 fares. Passenger schedules in many parts of the country have been readjusted in view of the new conditions and service has been increased in many instances where it appeared necessary. Additional lines of sleeping car service has been put on. Some of the recent changes in this direction, include the restoration of a special parlor car with an extra fare of $1.00 between New York and Atlantic City, the restoration of observation lounge cars on the Chicago, Burlington & Quincy train between Chicago and Lincoln and Chicago and Denver, the restoration of observation cars on the Burlington and Northern Pacific between Chicago and St. Paul and St. Paul and the Pacific Coast, the restoration of the New York Flyer between New York and Harrisburg, club cars being placed in service between New York and Plainfield, replacing of parlor cars on through trains between Richmond and Norfolk, additional dining car service on the Pennsylvania Limited between New York and Pittsburgh, and in many other places where a specific announcement has not been made. The winter tourist travel to Florida resorts has been unusually heavy and appears to have been well taken care of and passenger traffic has been generally heavy in most parts of the country.

Aside from matters of service, the Railroad Administration has taken several other steps in the direction of restoring former conditions. The Division of Capital Expenditures had given up a large amount of its control over capital expenditures and had announced a general policy of not undertaking capital improvements without the approval of the corporations before the failure of the railroad appropriation bill and before the acute financial condition of both the railroad companies and the Railroad Administration caused by the inability of the latter to meet all of its obligations promptly had developed.

There has been some "unscrambling" of railroads by transferring parts of systems from one region to another so as to bring the entire system into the same region in several instances. The most noteworthy changes of this kind were in the Allegheny and Eastern regions and the transference effective on March 1 of the Illinois Central line north of Cairo to the Southern region and of several other railroads from the Southwestern to the Central Western region, accompanied by a regrouping of the lines in the Southwestern region.

A circular recently issued by the director of the Division of Operation providing for a relocation of equipment more in accord with ownership than has been practicable during war conditions and providing to a greater extent for use by the owner of equipment of its accepted standards was also in the direction of restoration of pre-war conditions.

Passenger Fares

A large part of the general revision of local passenger fares which has been in progress for several months was completed with tariffs filed to become effective on March 15 or on April 1. When the general advance of passenger fares to 3 cents was put into effect last June temporary tariffs were used at first and the more permanent tariffs have been filed from time to time, using the new distance table which was worked out last summer. In the new rates less attention is paid to the competitive influence which affected passenger fares before the period of federal control and rates via circuitous routes which were formerly made to meet the short line fares have in a large number of instances been increased in proportion to the mileage, although between common points where the difference in mileage of various lines is slight the rates are made the same. The Railroad Administration has announced its intention of making a campaign to cultivate passenger traffic, particularly during the summer, now that passenger equipment is more plentiful than last year and, as announced in last week's issue, reduced summer tourist rates will be made to the Pacific Coast and to summer resort points. However, the former practice of publishing special convention fares, which was gradually being eliminated by the railroads even before federal control, is not to be re-established this year, although

travelers to conventions will be given the advantage of the summer tourist rates. A large number of reduced convention fares were formerly allowed because one railroad which saw an opportunity to develop a considerable business would agree to make a reduced rate and the others would follow in line. Under government control it is felt that there should be no discrimination between the various organizations or classes of organizations which petition for special fares and to grant a special reduced basis of fares for all conventions would unduly deplete the passenger revenues. This is an important consideration because the cost of operation has not been materially reduced since the cessation of the war.

The Railroad Administration has been besieged by shippers for reductions in rates on the theory that the traffic cannot stand the increases imposed as a war necessity and some reductions in rates have been allowed, as in the case of the export rates to the Orient via the Pacific Coast, to meet particular situations, but the administration has naturally declined to give consideration to any idea of reducing the general level of rates, taking the position that the higher rate level imposed during the war is necessary to meet the decreased purchasing power of money. The extra fare charged for Pullman passengers was taken off shortly after the signing of the armistice, but apparently no consideration has been given to any idea of reducing the general level of passenger fares.

Reorganization of Divisions of Finance and Purchases

As previously announced, the Division of Finance and Purchases is being reorganized as two divisions.

A finance committee has been appointed consisting of: John Skelton Williams, chairman; Franklin Q. Brown, Harry Bronner, Frederick W. Scott and James N. Wallace. This committee will submit to the director general from time to time its advice on matters of financial policy and will also make to the director general preliminary reports on any proposed railroad reorganizations which may require his approval. Mr. Brown, Mr. Scott and Mr. Wallace have heretofore been members of an advisory committee in the finance section.

Also an advisory committee has been appointed consisting of John Skelton Williams, chairman; Robert S. Lovett and Henry Walters. This committee will submit to the director general from time to time its advice regarding matters of policy with respect to purchases and for that purpose is authorized to make the necessary investigations.

Circular No. 1 of the Division of Purchases announces that Samuel Porcher and George G. Yeomans, heretofore members of the Central Advisory Purchasing Committee, are appointed assistant directors of the Division of Purchases, and William W. Morris, heretofore secretary of the Central Advisory Purchasing Committee, is appointed assistant to the director, Division of Purchases.

H. C. Pearce, manager, Procurement Section; M. E. Towner, manager, Forest Products Section; E. J. Roth, manager, Stores Section; and B. P. Phillippe, fuel distributor heretofore reporting to the chairman of the Central Advisory Purchasing Committee, will report to the director of the Division of Purchases.

Agricultural Section Plans Development Work

The Railroad Administration's agricultural section, in cooperation with the Department of Agriculture, is making plans to resume its agricultural development work throughout the country, which, on account of the war, was, of necessity, curtailed to a great extent.

A call has been issued for a general meeting of some 200 representatives of railroads engaged in this particular class of endeavor, who will assemble at Memphis, Tenn., on April 2, for a three days' session. Agents of the Department of Agriculture have been invited to take part in the deliberations. The problems to come before the gathering will include those of marketing, agricultural extension methods, raising of more and better livestock and poultry, dairying, fruit growing, information for homeseekers, best methods for assisting new settlers, farm credits, and co-operation of local organizations.

During the war railroad agricultural agents were engaged principally in helping to increase the food production of the country. When hostilities ceased the Railroad Administration arranged for a reorganization of the forces of the individual roads which did so much to help in building up the country before the outbreak of the war. A more thorough co-operation with the Department of Agriculture than previously had obtained was also brought about.

Reports from chambers of commerce, bankers, associations of farmers, newspapers, and business men received by the Railroad Administration indicate that there is a strong sentiment manifest throughout the country toward better farming, which means heavier and more economic production, with improved marketing conditions.

At the Memphis meeting a program will be adopted for utilizing this sentiment to the best advantage in order that the general development of the agricultural resources of the country may be carried on with even greater energy than was displayed before the war.

Advertising Campaign and Reduced Fares to Promote Passenger Travel

Director General Hines has announced the intention of the railroads under federal control to engage in a limited advertising campaign in newspapers and national magazines for the purpose of promoting travel to the National Parks and principal health and pleasure resorts. This campaign, which will be nation-wide in its scope, will be supervised in every detail by the three Committees of Passenger Traffic Officers, located in New York, Chicago and Atlanta, respectively.

Reductions in Rates on Road and Building Materials

In a statement issued on March 20, the director general said:

"Various inquiries have been received as to whether the Railroad Administration contemplates a reduction in freight rates on materials used in construction of buildings and therefore it becomes important to make it clear that no such reductions are in contemplation.

"The Railroad Administration is, however, giving consideration to the question of making reduced rates on crushed rock, stone, sand and gravel for road construction when consigned to and the freight thereon is paid by a federal, state, county, parish or township government.

"Before the matter can or will be definitely determined, it is intended to ascertain what, if any, reduction necessary to establish a stable price, will be made in the price by those producing and supplying the materials."

Four Standard Forms of Waybills Prescribed

General Orders Nos. 11 and 21 provide for the adoption of universal interline waybilling. A standard form of waybill was prescribed in General Order No. 11, which is now amended, and General Order No. 60 has been issued prescribing four forms of waybills.

A—Single consignments.
B—More than one consignment.
C—Astray freight.
D—Live stock.

Form AC No. 506 is for all single c. l. or l. c. l. consignments, local or interline; but a single waybill may be made for a special train moving at a lump-sum charge or for shipments which, on account of their length, require more than one car. The size of this waybill is 8½ ins. by 11 ins., but for special classes of traffic may be 8½ ins. by 22 ins. Paper

must be equal to 60 lb. (or heavier), No. 1 manila, 24 in. by 36 in.

Form AC No. 507 is for blanket waybilling of more than one consignment of l. c. l. freight, local or interline, sizes same as preceding; paper equal to 40 lb. (or heavier), No. 1 manila, 24 in. by 36 in.

Form AC No. 508 is for waybilling astray freight; size 8½ in. by 11 in.; paper equal to 40 lb.

Form AC No. 509 for livestock c. l. when special stub is required at destination stock yards; size 8½ in. by 11 in., to be printed in two parts, the additional part for the use of destination agents at livestock centers in collecting transportation charges; paper equal to 60 lb.

Necessary copies of waybills may be made on forms like those or on plain paper, but on paper of lighter weight. All waybills must be prepared with typewriter, pen and ink, or indelible pencil. The practices and blanks used by carriers in preparing underlying forms at the time of making the waybill must be adjusted to meet the arrangement and requirements of the new forms.

Regulations are prescribed for notations at transfer stations. Paster scale tickets must not be larger than 2 in. by 4 in.

These new forms must be used not later than June 1, 1919, but may begin earlier. The astray freight waybill must be used not later than June 1, 1919.

Stocks of old waybills on hand may be used after June 1 in waybilling local l. c. l. shipments.

Where weight of a carload shipment cannot be given at the time of making waybill, and it is not desired to complete waybill by using an estimated weight, 110 per cent of marked car capacity should be used; and in proper space show the point where car is to be weighed.

This order does not discontinue the so-called mani-bill, uni-bill, or the consolidated billing and abstracting plan. These forms of billing when they are economical and efficient in their operation, may, until further advised, be continued in use for l. c. l. local traffic.

Conditions in Eastern Region

In marked contrast to conditions which prevailed in the Eastern region during the month of January and February, 1918, when the most severe winter weather in history was experienced, the railroads in this territory during the first two months of 1919 were in a position to handle a much larger traffic than was offered, according to a report from A. H. Smith, regional director for the Eastern region, to Walker D. Hines, director general of railroads. While there was a falling off in business, due to the signing of the armistice, 1,105 special export trains were handled from western termini during the first two months of 1919, containing 28,116 cars of export freight. During the month of January 15,092 cars of export freight were delivered to steamers at New York, and in February 12,590 cars, a total of 27,682, of which 5,802 were flour.

The movement of livestock, dressed beef, provisions and other perishables from the west was heavy, the average daily movement for the first 20 days of January being 1,118 cars, the highest average for any similar period except October, 1918. On February 13, 1,146 cars were handled east from Chicago, the largest day's movement of which there is any record.

Mr. Smith reports that 100 per cent car supply was furnished for all business offering in the two months mentioned. He also states that approximately 85 per cent in January and 96 per cent in February of all passenger trains arrived at terminals less than 30 minutes late. Applications for export permits have been heavy throughout February, particularly on provisions and foodstuffs, and a total of 16,341 cars of foodstuffs were permitted, the indications being for a continued heavy movement of this character. Outside of foodstuffs, iron and steel are moving in the heaviest volume, February permits totaling 9,594 cars to New York.

A change in the shipping conditions with the assignment of ships for commercial export business has resulted in a rapid increase in commercial export shipments, 18,719 cars of commercial export freight being permitted during January and 20,709 in February for movement through the ports of New York and Boston. Through the re-routing of carload traffic to eliminate circuitous routes for the period from January 1 to February 7, 4,531 cars have been diverted, resulting in a saving of approximately 301,714 car miles in the region.

A shipping day guide for New York City was issued to take effect March 10, the plan having received the unanimous approval of the Merchants' Association of New York. Preliminary figures indicate that at New York alone approximately 1,000 tons per day formerly loaded transfers will be loaded direct to destination with attendant saving in transfer expense and improved service.

Accounting Circular

In Accounting Circular No. 81 the Division of Accounting says that consideration is being given to the need for establishing a uniform date for stating operating revenues, operating expenses and other income accounts, and for closing the accounts monthly, so that reports of results shall reach the division and be tabulated within the month succeeding that for which the reports are made. To the end that such a date may be ascertained and fixed, federal auditors of Class I roads are directed to promptly make reply to the following queries:

(1) What is the earliest date after the end of the month that revenues, expenses and other income items can be stated from the accounts as they are now kept?

(2) What is the earliest date after the end of the month that revenues, expenses and other income items can be stated from accounts built up from estimates based on data reasonably consistent and safe for making such estimates?

(3) If statements of expenses, revenues and income items are required to be reported to this division by the tenth of the month following that for which they are made, what is your opinion of the reasonableness and feasibility of basing such statements upon accounts, closed if necessary, at the end of the month upon estimates and adjusting the difference between estimates and regularly ascertained figures in the subsequent months' accounts and reports?

(4) What changes in your system of accounting will be necessary if you were obliged to state the accounts and determine the revenues, expenses and other income items by the 10th of the month following that for which the report is made?

(5) What would be the additional cost, if any, to close the accounts in time to submit therefrom a statement of income not later than the 10th of the month following that for which the report is made?

(6) Are you now making for the information of your federal manager or other officers, estimates, either weekly or monthly, of revenues, expenses, and other income items, and how do such estimates compare with the recorded figures when ascertained? If you were making such estimates prior to January, 1918, and have since abandoned them, what was the reason for so doing?

Freight in Central Western Region Moves Freely

According to a report from Hale Holden, regional director for the Central Western Region, to the director general, conditions generally were favorable to all railroad operation during the month of February and all traffic moved currently. The equipment of all classes in this region was plentiful during the month and a surplus of box and coal cars has accumulated. Mr. Holden states that the hog movement in the region is rapidly returning to a normal basis, which will

make possible the removal of embargoes at all primary markets within the near future. The Kansas City market handled a total of 10,906 cars of livestock inbound, an increase compared with February, 1918, of 769 cars. A total of 3,390 cars moved outbound, an increase of 723 cars for February, 1919, over the corresponding month last year. Four hundred and thirty-six special oil trains were operated from the Mid-Continent field during the month with 10,904 cars, an average of 25 cars per train. One hundred and six special trains were employed in the transportation of troops, a total of 45,790 men being handled.

Terminal managers report favorable conditions with a free movement and interchange of traffic through all terminals. The Illinois Central railroad made several readjustments in its passenger train schedule in Illinois during the month in the interest of "on time" service, and was authorized to add an additional train between Clinton, Illinois, and St. Louis, Mo., which resulted in an increase of 105,850 passenger train miles per annum.

Export Rates to Orient to Be Reduced

Director General Hines has announced the purpose of the Railroad Administration to put into effect as soon as the tariffs can be prepared and filed, new rates on export traffic to China, Japan, Australia and Philippine Islands, applying from territory adjacent Missouri River and east through Pacific Coast ports. The new rates are reductions from the existing rates, but somewhat higher than those in effect before the export rates were cancelled last year. The proposed rates follow:

Commodity	Rate per 100 lb.
Articles described in Item 5 Trans-Continental Tariff 29-B	$1.75
Agricultural implements	1.00
Iron articles (general mixture)	.60
Car wheels and axles attached	.60
Boiler iron	.60
Cast iron pipe	.60
Wrought iron pipe	.60
Roofing iron	.60
Machinery, including grading and road making machinery	1.00
Sewing machines	1.10
Oil, lubricating	.90
Oil well supplies	1.00
Railway equipment (axles, beams, couplers, etc., comb.)	.75
Railway equipment (cars, passenger and freight)	.75
Railway equipment (locomotives, etc.)	.75
Tobacco, manufactured	1.35
Tobacco, unmanufactured	1.40
Automobiles and parts—	
Passenger	3.75
Freight	3.00
Canned goods	1.00
Chocolate	$1.50
Cotton piece goods	1.20
Glass, window, etc.	1.10
Glass, plate, no limit as to measurement not exceeding 120 united inches	1.40
Iron, pig	.55
Iron castings	.70
Lime, acetate of	.65
Milk, condensed	1.00
Paint, etc.	.70
Paper, etc.	.90
Pig lead	.75
Plumbers' goods	1.50
Roofing, etc.	.90
Wire rope	.70
Soap	1.00
Soda ash, caustic soda, etc.	.60
Spelter	.75
Starch	.90
Steam or hot water heating apparatus	1.25
Wheelbarrows	1.10
Wood pulp and wood pulp board	.75
Zinc plates and sheets	.80
Vehicles	1.40
Wax, paraffine	.90

War Department Pays $100,000,000 on Account

The Railroad Administration on March 21 received from the War Department $100,000,000 on account for freight and passenger transportation services heretofore rendered by the railroads under federal control for the War Department. In ordinary course these payments would have been spread over the next three months. While ordinarily such payments would have been made directly by the War Department to the federal treasurers of the various railroads which rendered this service, it was arranged in order to meet more conveniently the present financial situation that the money be paid directly to the Railroad Administration at Washington. The sum thus received will therefore in substance be subtracted from what the railroads would otherwise have received in approximately the next three months, and hence must be distributed by the central administration to meet the current cash requirements of the federal treasurers.

Offices of Managers of Inland Traffic Being Discontinued

The offices of manager of inland traffic in the various government departments, created by the appointment of traffic representatives of the Railroad Administration last year for the purpose of co-ordinating the traffic requirements of the government, have now been discontinued, and the officers have been assigned to other positions in the Railroad Administration or are returning to their former positions. H. P. Anewalt, who has been manager of inland traffic of the Navy Department, has been appointed assistant director of the Division of Traffic, succeeding C. B. Buxton, resigned to return to his former position as vice-president of H. L. Edwards & Co., of Dallas, Tex. F. M. Whittaker, manager inland traffic of the Fuel Administration, will return to his office of traffic manager of the Chesapeake & Ohio; H. M. Adams, manager inland traffic of the War Department, has been appointed traffic assistant to the regional director of the Southwestern region, at St. Louis, succeeding W. B. Biddle; D. L. Gray, manager inland traffic for the Shipping Board, will become traffic assistant to the regional director of the Eastern region at New York; O. M. Conley, manager inland traffic of the oil division of the Fuel Administration, has returned to his former position on the St. Louis-San Francisco; C. E. Spens, manager inland traffic of the Food Administration, became assistant director of the Division of Traffic on March 1, and T. C. Powell, manager of inland traffic of the War Industries Board, became director of the Division of Capital Expenditures in January.

Contracts Executed

The Railroad Administration has executed compensation contracts as follows: St. Joseph & Grand Island, $373,811; Louisiana & Mississippi Railroad & Transfer Company, $41,689; Georgia, Florida & Alabama, $57,637; Bangor & Aroostook, $1,575,171, and Detroit, Bay City & Western, $85,967, also cooperative short line contracts with the Randolph & Cumberland, Ironton, the Oneida & Western, Williamsport & North Branch, and St. Louis, Kennett & Southwestern.

Conditions During February in Allegheny Region

According to a report from C. H. Markham, regional director for the Allegheny region, transportation conditions in that region for the month of February showed continued improvement. Owing to the mild winter experienced, coal loadings in the region decreased 61,804 cars compared with February of last year. Tidewater coal dumped amounted to 1,660,730 tons, an increase of 104,494 tons compared with February, 1918.

This region was practically clear of all embargoes on domestic freight by the end of February, and permits were freely issued for grain coming from the West on account of the resumption of overseas movement.

The railroads in this region received 10 locomotives built in their own shops during February, 1919, 13 from the locomotive builders to be applied against the 1918 program and 15 from builders to be applied against the 1919 program, a total of 38 locomotives during the month.

Posters to Illustrate Firing Methods

The Fuel Conservation Section has prepared two colored posters showing the interior of a locomotive firebox for the purpose of illustrating the effects of irregular firing methods, to be posted in roundhouses, foremen's offices, Y. M. C. A. buildings and other places where they may readily come to the attention of railroad enginemen. The method of illustration was employed in the presentation of a paper by D. C. Buell on "The Proper Method of Firing Locomotives" at the fourth annual convention of the International Railway Fuel Association and was amplified and enlarged upon by the University of Illinois engineering experiment station in a circular from which the illustrations were taken.

The British Transport Bill Severely Criticized

Proposed Establishment of Ministry of Ways and Communications Meets Strong Opposition by Many Interests

THE BILL to establish a ministry of ways and communications which was introduced in the British House of Commons on February 27, as noted with the abstract of the bill in last week's issue of the *Railway Age*, page 787, has resulted in an amount of discussion in the British press in keeping with the broad provisions of the bill and its somewhat striking proposals.

The discussion of the bill, at least in the papers that have reached the office of the *Railway Age*, shows that much opposition by influential interests has already developed. Opinion is divided as to the general idea of combining under one head all the means of transport in the United Kingdom, but all those who treat of the subject bring out points in the measure that they think need correction.

Sir Eric Geddes Expected to Be Minister

All those who discuss the matter agree that the first minister to be chosen will be Sir Eric Geddes. All recognize his ability as an organizer, but several doubt whether as a railroad man he will not treat the other means of transport with a railroad man's point of view only, while others fear that a change of government may result in the appointment as minister of ways and communications of a man of much smaller calibre.

Sir Eric Geddes was formerly deputy general manager of the North Eastern Railway of England. In the early part of the war he was engaged in organizing the supply of munitions. Thereafter he became director-general of military railways, and then director-general of transportation. In March, 1917, he was appointed inspector-general of transportation in all theatres of war, following which, in May, 1917, he became vice-admiral and controller of the Navy, and in July, 1917, first Lord of the Admiralty. He is at present in the cabinet as Minister Without Portfolio.

The thing in the bill that has received the most consideration, of course, is its all-inclusive nature, whereby control is vested in one man, the Minister of Ways and Communications over railways, light railways; tramways; canals, waterways, and inland navigations; roads, bridges and ferries, and vehicles and traffic thereon; harbors, docks and piers; and the supply of electricity.

Drawbacks Likely to Be Serious, Says the Statist

"Theoretically there is a very great deal to commend such a proposal as that the whole transportation traffic of the country should be supervised by one instead of by many bodies," says the Statist in its issue of March 8. "But, the drawbacks in practice are likely to prove very numerous and very serious. It is not surprising that very considerable opposition has been aroused to such a sweeping proposal, which may be counted upon to have far-reaching consequences, whether for good or for ill. If one could imagine such a department being under the control of a passionless, absolutely impartial being, possibly the placing of the control of the whole transport business of the country in one hand would be an ideal solution of an admittedly difficult problem. It has to be remembered, however, that such a Board has to be administered by human beings very much like the rest of us; and, consequently, absolute impartiality, however honestly it may be aimed at, is not likely to be attained in practice.

"The most serious objection so far raised has been the placing of the control of the railways and the roads under one single authority. A careful examination of the facts will, we think, disclose to the reader that the interests of the railways and the interests of the roads are very far from being identical, and that in all probability, if they are controlled by one single authority, the interests of one will be sacrificed to those of the other. It may not prove to be so; but it is certainly desirable to bear the probability in mind."

Bill Said Not to Be Inclusive Enough

The Railway Gazette (London), takes an entirely opposite view as to the scope of the bill, but it is one of those that fears that a less able man than Sir Eric Geddes may become minister before the expiration of the two years provided as the term of the bill's provisions. "The one serious omission," it says in its issue of March 7, "appears to be that, whilst the cross-channel steamship services of railway companies come under its control, coastwise shipping is not included. In an island country such as this coastwise shipping has had a greater effect on railway policy and the flow of traffic than is generally realized. But despite this apparent omission, the powers vested in the proposed new ministry are tremendous. To accomplish all that could be achieved under the wide powers it is intended to vest in this ministry will require not only a great staff, but many men with big brains, practical experience, much tact and much imagination as consultants and directing heads of departments.

"If the bill is not spoiled in its passage through Parliament by whittling down its scope, much may be accomplished with Sir Eric Geddes as Minister of Ways and Communications. He has big ideas, much courage, and can get things done. He is a keen judge of men and will select his staff with a single eye to their suitability for the posts he wishes them to fill. One danger to be faced is that, as a result of opposition by those who are temperamentally incapable of taking big views of anything, the Act may be such an emasculated edition of the bill, and the powers of the proposed ministry so crabbed and confined, that Sir Eric Geddes may see that there is no possibility of 'delivering the goods' and, at the eleventh hour, refrain from embarking on this great adventure. But even if Parliament does not spoil the measure, there is the ever present danger that a change of government may mean a less progressive Minister of Ways and Communications. The task is so great and its possibilities so tremendous, that to have this office filled in a year or two's time by a small-minded politician would be calamitous. We can only hope that these risks will not materialize. The greatest danger lies in a change taking place in the early years before the new Ministry had got properly to work. Once a concern is organized and running smoothly it is easier to find others who can carry on. Nevertheless, there will be difficulty in the avoidance of the bureaucratic environment which stifles enterprise and initiative.

"To remove such transport, docks and harbors, or the generation of electrical power from the control of the new ministry, would at once frustrate any attempt to co-ordinate and improve the country's transportation facilities. If canals were not included they would be the greater losers. Much has been written about the wasteful competition between railways in the past. To avoid a repetition of this with mechanical road transport is presumably one of the reasons for placing roads and road transport under the Ministry of Ways and Communications. We understand that great de-

velopments are contemplated in the extension of electric traction, and the super-power plants can be utilized for supplying electric power to the railways, to the factories adjacent thereto, to barges for the canals, and for charging electrically-propelled road vehicles."

Bill Will Encourage New Construction

The Engineer (London), finds much of value in the bill but is much opposed to the great power that is given to the minister, and also expresses its belief that a minister less able than Sir Eric Geddes might do much harm. "Opposition to the bill is appearing in many quarters," it says, "and we shall be surprised indeed if various modifications are not introduced before it finds its way to the statute book."

In speaking of the good points of the bill it says: "The situation of British railways today is hopeless. In 1913 the railways of the United Kingdom distributed fifteen million pounds in interest on debenture stock and other miscellaneous fixed charges, and thirty-five millions in dividends on guaranteed, preference and ordinary stock. As last year, the expenditure was about sixty millions more than in 1913, the whole surplus is more than wiped out. It must be observed, too, that before the war, capitalists had little sympathy for the railway market, and the companies were, therefore, afraid to embark on necessary new works, and consequently waited for the better days that have not materialized. It is obvious then that the companies cannot return to the status quo.

"The bill cannot be said definitely to propose nationalization. The minister may, under clause a of sub-section 1 of section 4, purchase any railway or part of a railway, but under clause d of the same sub-section he may, on the other hand, lease the whole or any part of any undertaking so acquired or established. Thus a similar condition to what prevails and is admittedly successful, in India, would be brought about. Our deduction that the railways will not be nationalized in the usual acceptance of the term is further confirmed by section 5, which authorizes the minister to make grants for the construction, improvement and maintenance of railways—other forms of transport are mentioned similarly, but here and elsewhere we allude to railways in particular, as they are the principal means of transport. Yet another gleam of hope is seen in the opening words of section 3, wherein we find the words: 'With a view to affording time for the consideration and formulation of the policy to be pursued as to the future position of undertakings.' These are features that should appeal to the railway interests, which may find also some comfort in the paragraphs V, VI, VII and VIII of clause c of sub-section 1 of section 3. The railways are instructed there to obey the directions of the minister as to alterations, improvements and additions for the more efficient and economical working of the undertakings; for securing the common user of facilities, rolling stock and equipment; for securing running powers over other undertakings, and that the purchase of stores shall be conducted in such a manner as may be most conducive to economy and efficiency. These betterments begin at once—after the act is passed—and may be continued for the two-year period during which the government guarantees the net receipts on the 1913 basis. What a splendid opportunity is thus offered for getting necessary new works done, obtaining improved equipment for goods stations, electrifying busy passenger sections, and so on. Again, clause IV would allow the permanent way, rolling stock, plant, appliances and equipment to be modernized, seeing that the railways have to take any directions of the minister as to these things being satisfactory in type and design. It is true that many of these concessions have to be bought at a price. No longer, for instance, will directors be able to appoint, promote, or advance the salaries of officers, nor will officers be able to do these things for their staff. A company in a favored position as to route or in its station facilities must share these advantages with its less favored neighbor. Yet another point the companies must remember is that after the two-year period the minister is not bound to take them over. A company which may have been set on its feet during the two-year period may not wish to be taken over, and, apparently, if the minister does not insist in absorbing it, it will not be disturbed. Lastly, there is the shareholder. He has no new cause for complaint. By the present bill he gets for two years the same guaranteed net receipts as in 1913, and should his undertaking be absorbed he will be entitled to just as much as under the act of 1844. Were the purchase made under that act, the terms would, no doubt, be the amount awarded by arbitration; under the new bill they would be fixed by agreement, or, failing agreement, by arbitration."

To Rush Measure Unjustifiable

Engineering, (London), finds much to oppose in the bill. "To rush through Parliament a measure which not only confuses control with purchase, but is calculated to extend governmental bureaucratic methods to the transport industry, is, in our opinion, wholly unjustifiable," it says.

"We have set out this series of powers in detail. They are extremely far reaching. If exercised—and Sir Eric Geddes is not the man to leave power unused—the first result will be to reduce railway boards of directors to the position of ciphers so far as the control of the shareholders' property is concerned; the Minister of Ways and Communications would be in the position of managing director of the railways, harbors, etc. A company's line might be closed wholly or in part; its engines and rolling stock, and even fixed appliances and equipment might be inextricably mixed up with those of other lines; its organization might be upset; in short, the value of the undertaking might be seriously affected. All this on a guarantee for two years of the same terms as to payment as during the past four years, while at any time the minister might decide to force a purchase of the whole or any part of the undertaking, in the manner to which we shall refer later.

"We quite agree that it is necessary promptly to deal with the question of railway rates and charges which need to be overhauled not only with the object of raising revenue to meeting the enormous increase in the cost of working the lines, due to concessions granted by the government to the employees, but to remove anomalies and to improve the system of charging. Power might also be given to facilitate and co-ordinate inter-railway working, and to authorize and finance works for the more efficient and economic working of the railways, but so long as there is the possibility of a complete return to private ownership there should be some respect for the property and corporate existence of the systems which have been built up on the basis of Acts of Parliament. From this point of view we regard the provisions of the bill as excessive. In this we are supported by the Federation of British Industries, . . . etc. These bodies have placed on record their opinion that in any form of control which it may be decided to adopt, the government should not in any case be concerned with the detailed administration of the railways. The bill certainly provides for very considerable interference in administrative matters, and should it emerge as an act in anything like its present form there will be an enormous extension of the civil service. The Ministry of Munitions—with whose organization Sir Eric Geddes was associated—expanded to enormous dimensions largely on borrowed staff, and it is significant that the bill with which we are now dealing contemplates the transfer to the minister of any officer or servant of an undertaking of which possession is taken whose services the minister may require, 'either permanently, with the consent of the officer or servant, or temporarily, with the consent of the undertakers.' Moreover, the bill is far from specific as to the payment of staff transferred to the Ministry. During the war hundreds—if not thousands—of men have worked in

various departments of the state but have been paid by railway and other companies. What may have been justifiable in war time should not be tolerated in future.

"We now come to the question of State purchase. As has been pointed out, there is the astonishing proposal that so important a matter shall be done by an Order in Council. We cannot think that this will be sanctioned by Parliament, but it is seriously proposed. The bill provides that the minister may purchase by agreement or compulsorily and work the whole or any part of any railway, light railway, tramway, canal, waterway, or inland navigation, harbor or dock. The only limitation is that a tramway, belonging to a local authority, shall only be acquired with the consent of the authority. Railway companies will doubtless have noticed that the basis of any purchase is not defined; the minister is to have the right to specify the financial arrangement, the only appeal being to a court of arbitration 'constituted in accordance with the provisions of the Order authorizing the acquisition.' Railway directors and shareholders may well contemplate this scheme with misgivings. But in addition to purchasing railway and other undertakings, the minister may establish new ones, for which purpose he may compulsorily acquire land; he may lease the whole or any part of an undertaking which he acquires or establishes; he may purchase, hire or lease railway wagons belonging to private owners; and may establish, maintain and work transport services by land or water—all by Order in Council. Over undertakings acquired or established the minister would have absolute control. 'He shall be entitled to fix such rates, fares, tolls, dues and other charges as he thinks fit, notwithstanding any statutory provision limiting the amount of such charges or increase therein affecting the undertaking, and shall have all such other powers of management as may be necessary for the purpose,' and he may 'discontinue the working of any part of the undertaking where he considers such discontinuance is expedient in the national interest.' When it is remembered that railway companies own large engineering works, manufacturing anything from furniture to locomotives; operate steamboat services; run hotels, motor cars, and goods and parcels road services; such diverse branches of industry as laundries, printing establishments, gas works, etc., the potentialities of this project for nationalization, and state competition with private enterprise will be apparent.

"In our opinion, the association of roads and the supply of electricity with railways is wholly unjustifiable. . . . It is the most unconvincing special pleading to suggest that the control of electric supply should be vested in the Ministry of Ways and Communications because the railway property might be used for lines of overhead high-tension wires, while as regards railway electrification we are far from sharing the opinion of a labor correspondent of a non-technical journal that 'railways will in the near future be electrified and canals will carry electrically driven barges.'

"What has to be secured is that the financial position of the railway companies shall be restored. This can be done by reducing expenditure or increasing the revenue, and it might be facilitated by a well-considered form of government control. The Board of Trade have always had considerable powers over the railways, and there is no harm in transferring those powers to a new authority, especially if that authority proves to be broader minded and less bound by red tape than the Board of Trade. It is also necessary to invest some department of the state with the power of varying railway rates and charges and simplifying the present basis of charging. Further, as the railway companies will not be in a position to raise capital, it is necessary that, under certain conditions, the state should finance schemes of improvement, but having said this, we hold strongly to the opinion that the detailed administration of the railways should be vested in the individual companies, and that the state should not embark on a scheme of nationalization until the whole matter has been threshed out in a much more complete manner than has, so far, been the case."

Mexican Railway Executives Visit New York

By P. Harvey Middleton,
Executive Assistant, Railway Business Association

THE VISIT to New York City on March 26 of two of the principal operating officials of the Carranza Railway Administration, M. Muñoz, general superintendent of the National Railways of Mexico, and Rafael Zerecero, assistant general manager of the southwestern lines of Mexico, afforded an opportunity of obtaining at first hand a few facts to supplement my article in the *Railway Age* of March 14.

"We are handling," said Mr. Muñoz, "16,000 tons of freight daily on a 3½ to 4 per cent grade. About 7,000 tons of this is on the Interoceanic route from Mexico City to Vera Cruz, Puebla, and branch lines. The principal commodities carried are sugar, flour, oil, coffee, corn, rice, cattle, lumber, rubber plant and tobacco. We export all our high grade lumber such as mahogany to the United States.

"Our locomotives are principally from the Baldwin Locomotive Works. We have a number of Mallet compound locomotives and also some double header Fairlie engines of English manufacture. We are fairly well supplied with equipment, but we need tank cars. At present only 5 per cent of our tonnage is export or import, the rest of it being domestic. Our tracks are in first class condition with good solid beds. We use principally hardwood ties, but we have some steel ties, although I don't like them. Some of our roadbed is ballasted 5 meters deep; it is good and solid.

"Señor Fontes, our general manager, is doing everything possible to encourage traffic into Mexico through the Pacific ports, and English steamers are making regular calls at the Gulf ports. It may interest you to learn that it takes an average of only 68 hours to unload a 5,000 ton steamer at Salina Cruz on the Pacific and carry it across the Isthmus of Tehuantepec to Puerto Mexico on the Gulf coast.

"The Mexican government has recently acquired by purchase from the Pearsons of London the National Railway of Tehuantepec, and this railroad, on the narrowest part of the continent with the exception of Panama, has been put in first class condition. We have two steamers running from Vera Cruz to Puerto Mexico making three trips a week carrying passengers and express packages. We have an ice plant at Salina Cruz and we have refrigerator cars for perishable freight like fish and fruit. The Tehuantepec Railway furnishes the electric light service in Salina Cruz and Puerto Mexico and we are going to establish competitive rates from Salina Cruz to Mexico City to meet the same rates as those from Manzanillo, which is the port of entry for traffic from the western ports and from Asia.

"Through our purchasing offices in America we buy rolling stock, cars, locomotives, rail fasteners, bridge material, brake equipment and tires. We make our own rails and we also operate machine shops at Orizaba, Mexico City, Vera Cruz and in several other places. We are now building hospitals at different points on our lines and we are getting prices from American firms for the necessary equipment. There are now no rebels on our lines, for we have just captured the town of Cuautla, in the state of Morelos, which was Zapata's former headquarters, and we have daily passenger service there. There is, of course, an occasional bandit raid in an out-of-the-way place, but I am told that even in New York City there is an occasional holdup. Generally speaking, Mexico is today normal and business is proceeding briskly. American manufacturers are sending their repre-

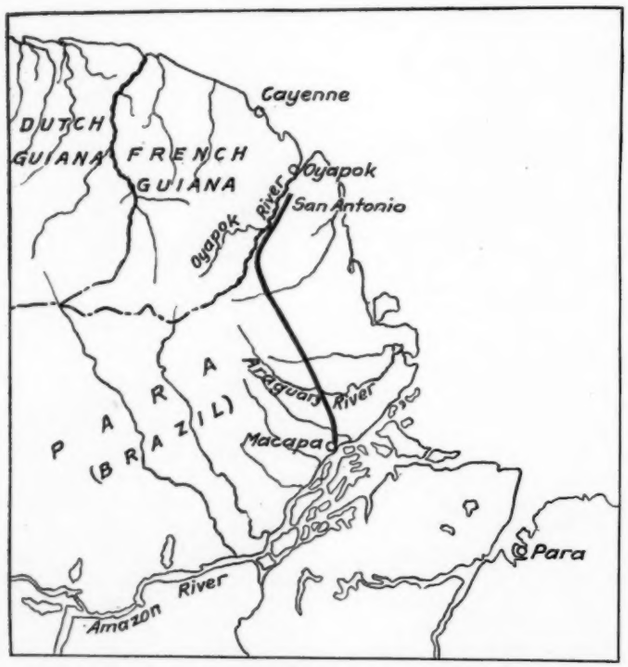
sentatives in increasing numbers, and a party of several hundred American business men representing the Mississippi Valley is leaving for Mexico in a few days to be the guests of President Carranza on a trip to Mexico City, Vera Cruz and Tehuantepec. We are most anxious to have American manufacturers come to Mexico and see for themselves the progress we are making. I can assure you that foreign capital will be protected by the Carranza Administration. One of the great obstacles at present is the delay on the part of the American government in granting passports. Everything should be done to facilitate commercial intercourse between Mexico and the United States."

Railway Developments in Foreign Countries

Proposed New Railway in Pará, Brazil—Interesting Figures of Exports from United States by Countries

Concession Granted for Railway to Be Built in Pará, Brazil

A CONCESSION has recently been granted to Antonio Amorin do Amaral for the building of a railroad from Amapá to Oyapock, both in the State of Para, Brazil, the latter town being located on the boundaries of French Guiana and called San Antonio, according to a report from Consul George H. Pickerell, Para. The region covered by this concession, which also embraces a strip of land estimated to be 9⅗ miles on either side of the line, is said to be rich in lands suitable for cattle raising, and to possess immense forests of timber of all kinds, especially that containing essences. The famous gold mines of the Guianas which have produced so much alluvial gold in the past are crossed by this line, and it is proposed to build a branch line that will touch the famous French Guiana mines, which are still producing large amounts with the most primitive machinery.



Approximate Line of the Proposed Railway in Para

The consul quotes from the Estado do Para of December 15, 1918, commenting upon the benefits to be derived from the concession:

The State congress of Pará voted and made public the law which grants to Mr. Antonio Amorim de Amaral, or the company organized by him, the concession for the construction of a railway line starting from the left bank of the Amazon River from a port, accessible at all times to ships of deep draft, near the town of Macapá, and continuing by the right bank of the Oyapock, in the neighborhood of a settlement known as Santo Antonio, crossing the Araguary River below the first waterfall from its mouth.

The railroad shall have, besides, a branch line to the last navigable port of the Calcoene River, thus bringing great advantages to all the vast and rich region above the falls which is at present inaccessible to exploration. This undertaking will be, as may be easily noted, one of the most gigantic steps toward the progress of this State.

The plan for the railroad lines reaches all the latitude of Brazilian Guiana, crossing the richest and most fertile regions of Brazil, the same that old explorers used to refer to as the El Dorado of the New Continent.

In an article published in the Jornal do Brazil, in Rio de Janeiro, Senhor Otto Prazeres says: "In those Brazilian regions can be found enough gold to serve as security to numberless issues of paper currency." Three ports have been constructed by France at her old colony, viz, Cayenne, Lourenço, and Oyapock, which are the outlet of all products from the Amapá (Guyana), causing thus considerable loss to our budget.

According to the statistics published in the "Association Française," for 1917, products worth 24,719,302 francs were exported through these ports. Before such splendid results the French Government which has already spent 1,000,000 francs in improving the harbor at Cayenne, is prepared to continue this work, its conclusion being estimated at 8,000,000 francs.

The Revista Commercial do Pará says: "The export of gold from the French Guiana for 1916-17 came to the stupendous total of 177,000,000 francs.

Not gold alone, but also other products which are its equivalent, valueless to us through lack of transport, have their outlet through the French ports.

To ease our financial condition, and to acquire a good security for our issues, it would suffice to explore or to give an outlet to the gold and other products accumulated in our territory and which are being exported to foreign countries through foreign channels.

What the South African Railways Buy

The South African railways in normal years purchase in the neighborhood of $63,000,000 of supplies yearly, but in the last two years their purchases have amounted only to about $20,000,000. These figures are taken from an article in the February issue of the British and South African Export Gazette, which contains the following interesting information:

Many factors contributed to make the volume of stores bought by the South African Department of Railways and Harbors during the 12 months ending March, 1918, smaller than in preceding years, particularly in regard to imported goods. The total purchases from all sources—in normal years they have amounted to over $63,000,000—were valued at $19,619,300, as compared with $19,676,800 in 1916. Out of this sum the High Commissioner's "list," representing purchases made through his office in London, amounted to no more than $3,041,820, against $6,155,270 in the previous fiscal period, and between $15,000,000 and $20,000,000 in the years before the war.

The extent to which the war reduced the proportion of purchases from overseas and correspondingly increased that of goods obtained locally may be judged from the fact that in 1913, 49 per cent of the purchases were of oversea origin and 51 per cent were bought in South Africa, whereas in 1917-18, 15 per cent of the purchases were made overseas and 85 per cent in South Africa; but as the general manager of the South African Railways states in his report, "The present position has been influenced in some measure by deferred deliveries of material unobtainable locally." For example, it has been exceedingly difficult to obtain rails, as they have been in demand for the various theatres of war in quantities beyond the present output.

Wide Range of Purchases.

Such being the case, there can be no wonder that South Africa has been unable to obtain delivery of goods long ago on order in the United Kingdom. Indeed, the purchases of

rails through the High Commissioner's Office in London during the year 1917-18 amounted to only $2,740, comparing with $1,022,500, 1916, and with amounts ranging up to half a million sterling in the years before the war. That is an extreme case, but it does not stand alone. Cement worth $16,335 was purchased through the High Commissioner in 1917-18, against $257,950 worth in 1916; electric gear to the extent of only $1,155, against $40,485; iron and steel, $26,475, against $77,750; locomotive, carriage, and wagon spares $359,620, against $552,450; machinery, $11,200, against $37,870; oils, $6,300, against $31,315.; piping, $1,385, against $9,810; and uniform clothing, $43,970, against $139,410.

On the other hand, rolling stock was represented by a figure which stood out among the rest, viz., $1,210,435, which though it showed a decrease on the $2,550,820 for 1916 and on the amounts for other years, was more comparable with them. Some items actually showed increased purchases, as, for example, brake gear, $26,425, against $11,445; copper, $49,320, against $36,625; fencing material, $6,400, against $975; and rope, $26,545, against $19,615. There were no oversea purchases of galvanized iron, timber, telegraph material, cotton and wool waste, and signal material, though all of these showed amounts in previous years.

Big Purchases When Normal Conditions Are Resumed

Quite apart from the interest attached to such figures as revealing the effect of the war on South Africa railway buying respectively from overseas and locally, these returns are of value to manufacturers as indicating the varied requirements of this great Government buying department, while they also suggest how much leeway will have to be made up when normal commercial and industrial conditions return. Indeed, the indents placed through the High Commissioner during the year under review are in themselves proof of this. They include rolling stock to the extent of $7,791,025; permanent-way material, $29,400; materials for tarpaulins, $426,140; locomotive spares and tires, $327,835; tin and metals, $72,525; carriage and wagon spares, $216,385; new machinery, $98,725; clothing, $504,025; catering, $53,500; stationery, $84,915; signal and telegraph material, $12,825; harbor and lighthouse material, $54,120; vacuum brake gear, $84,650; steam-heating gear, $2,870, and other goods, $96,285. These indents make a total of no less than $9,855,225, or two and a half times as much as the actual deliveries through the High Commissioner's Office in the same year.

[The South African Railways have been large buyers in the American market in the past three years. In 1917 they ordered 8 Mallet and 30 Mountain type locomotives in this country; in 1918, 20 Mountain type locomotives, and in February additional orders for 70 more were reported.—Editor.]

A Madrid-Valencia Direct Line

Following upon the Bill for the proposed direct line from the French Frontier to Algeciras (See the *Railway Age* of March 14, Page 611), a "Project of Law" has been published in the Gazette of February 15, by the Spanish Minister of Public Works, for the construction of the much talked of direct line from Madrid to Valencia, with a branch to Pasajes in Asturias. The proposed line is to be of standard 4 ft. 8½ in. gage, and in other respects is to follow the scheme authorized by the Royal Order of December 13, 1917, under the law of December 18, 1914, for the construction of various secondary railways. "The most extraordinary feature of these proposals, which mean spending $100,000,000 in second tracking existing railways," says the Railway Gazette (London, "is that they should come from a man like the Marques de Cortina, who in private life is a lawyer and banker, and who showed himself, on the occasion of his visit to England in connection with the 'Cortina' convention, to be endowed with the average amount of common sense. It is hardly to be expected that Congress will pass the schemes, in view of the formidable deficit, accumulated during the past five years, which must be liquidated by the 1916 budget. The cortes will surely recognize that if money is to be spent on railways there are plenty of blanks in the map without duplicating existing lines and creating a question of different gages. If a second line of railway is required between Madrid and Valencia, this could be obtained at relatively small cost, by connecting Cuenca and Utiel. Possibly the new schemes simply mean that the Minister wants to make a show of doing something during his brief term in office."

Exports of Locomotives in January Total $3,076,543

During the month of January, 1919, there were exported from the United States 87 steam locomotives, valued at $3,076,543, according to figures prepared by the Special Statistical Service Section, Division of Statistics of the Bureau of Foreign and Domestic Commerce. Well over half, both from the standpoint of number and value, were destined for eastern Asia, namely, 28, of a value of $1,077,898 for Russia in Asia, and 17, valued at $959,260, for Japanese China. Italy received 19, valued at $931,000. The figures in detail follow:

United States Exports of Steam Locomotives, by Countries, During January, 1919

Countries.	Number	
France	1	$7,050
Italy	19	731,000
Spain	1	30,700
Canada	4	53,213
Nicaragua	1	5,000
Mexico	5	52,805
Cuba	6	110,650
Colombia	1	23,200
Japanese China	17	959,260
Japan	1	10,927
Russia in Asia	28	1,077,898
Australia	2	11,615
Philippine Islands	1	3,225
Total	87	$3,076,543

Exports of railway track material during January included totals of $4,221,563 in rails, $189,408 in spikes, and $543,330 in switches, frogs, etc. In the case of rails, France, Japan, Russia in Asia and Cuba were the largest buyers. The figures in detail follow:

United States Exports of Railway Track Material, by Countries, During January, 1919

	Railroad spikes		Rails of steel	switches, frogs, etc.	
Countries	Pounds		Tons		
Belgium	422,920	$16,606	1,271	$113,590	$10,850
France	1,016,800	75,427	25,848	1,539,257	102,765
Italy	.....	.....	13,025	865,920	142,575
Netherlands	.....	.....	293	18,196	385
England	.....	.....	373	20,079	.....
Canada	587,840	16,965	2,638	107,338	31,390
Costa Rica	800	68	.....	.....	.....
Honduras	2,000	100	11	1,200	1,296
Nicaragua	1,300	100	7	500	104
Salvador	500	33	20	1,949	400
Mexico	98,545	6,241	101	8,845	10,365
Barbados	14,118	800	81	7,626	.....
Jamaica	6,000	416	33	2,066	338
Trinidad and Tobago	.....	.....	.....	.....	1,350
Other British W. Indies	3,000	210	14	906	2,164
Cuba	542,669	24,124	5,125	324,318	27,444
French West Indies	800	65	.....	.....	73
Haiti	.....	.....	.....	.....	355
Dominican Republic	14,850	1,547	56	4,000	773
Brazil	75,200	6,428	105	7,860	10,074
Chile	151,160	9,405	.....	.....	20,945
Colombia	12,300	950	545	30,239	1,240
Ecuador	20,000	1,340	.....	.....	81
British Guiana	.....	.....	38	5,082	.....
Peru	103,900	7,157	294	19,379	13,455
Uruguay	.....	.....	.....	.....	47
Venezuela	2,496	420	22	1,580	165
China	.....	.....	899	61,169	10,358
British India	.....	.....	.....	.....	168
Straits Settlements	18,817	1,124	99	6,778	3,550
Dutch East Indies	.....	.....	372	36,277	14,727
Japan	257,823	13,161	7,533	627,748	44,936
Russia in Asia	100,890	3,312	5,538	363,638	43,469
French Oceania	3,290	285	.....	.....	.....
Philippine Islands	51,126	3,124	663	46,023	44,328
Belgian Congo	.....	.....	.....	.....	3,160
Total	3,509,054	$189,408	65,024	$4,221,563	$543,330

The Special Statistical Service Section has also compiled figures showing that in the same month there were exported

car wheels and axles to the value of $278,393, of which nearly half went to Canada. The figures follow:

U. S. Exports of Car Wheels and Axles, by Countries, January, 1919

Countries		Countries	
France	$26,173	Colombia	$1,070
Greece	1,762	Ecuador	878
England	2,789	British Guiana	3,480
Canada	119,566	Peru	857
Honduras	2,031	British India	2,400
Mexico	17,606	Dutch East Indies	9,435
Other Br. W. Indies	55	Japan	2,997
Cuba	18,507	Russia in Asia	17,384
Virgin Islands	192	Philippine Islands	645
Argentina	46,001	British South Africa	3,500
Brazil	1,065		
		Total	$278,393

British Railway Supply Firms Secure Foreign Orders

The railway supply field in the United Kingdom is apparently busily engaged in getting back on its feet in export business in suuply materials. The Railway Gazette (London), in a recent issue notes the following items, representing orders placed principally by railways in India:

The East Indian Railway has recently placed an order for 14 locomotives, 0-6-0 type, broad gage, with the Vulcan Foundry Company, Newton-le-Willows.

The Rohilkund & Kumaon Railway (India) has placed an order for two engines, 4-6-0 type, metre gage, with Kerr, Stuart & Co.

The South African Railways have, we understand, placed an order with the Gloucester Railway Carriage & Wagon Company, Ltd., for 16 second class bogie carriages, and 25 day and night sleeping saloons.

The Great Eastern Railway (England) is considering tenders for 40 bogie carriages.

The Nizam's Guaranteed State Railways (India) have recently placed an order for five engines, 4-8-0 type, with Nasmyth, Wilson & Co.

The Eastern Bengal State Railways (India) have an order on hand with Head, Wrighton & Co., Stockton, for 300 four-wheeled covered goods wagons (broadgage).

American Builder Gives Best Price and Delivery

American competition in the supply of locomotives in what have hitherto been British markets, has excited attention in the British House of Commons. The Times (London), recently gave the following item in its Parlimentary news:

"Colonel Amery, Under-Secretary for the Colonies (Birmingham, Sparkbrook, C. U.), replying to Sir R. Cooper (Walsall, N. P.), said: 'An order for 12 locomotives for the Federated Malay States was placed in the United States of America in January last; the contract sum was $28,450 each, or £71,723 approximately in all. No British firm quoted a firm price. The lowest offer mentioned, £8,600 each, or £103,200 in all, as a probable sum, but was on a time and cost basis, and therefore liable to variation. This order was not secured to Great Britain because early delivery of the engines was of urgent necessity, and British firms could not begin delivery till November next, and could not definitely promise that; whereas the American firm promised delivery in six months.'"

[The order in question included 12 Pacific type engines, and went to the Baldwin Locomotive Works, as mentioned in the *Railway Age* of February 7.]

Standard Specifications for Industrial Materials

Four additional publications in the Industrial Standards Series of the Bureau of Foreign and Domestic Commerce are ready for distribution. These pamphlets contain standard specifications of the American Society for Testing Materials in English and Spanish, and are designed primarily for distribution in Latin American countries to assist in introducing American construction and engineering materials. The serial numbers of the specifications just issued and the products to which they relate are: No. 15, wrought solid carbon-steel wheels for steam railway service; No. 17, steel castings; No. 22, boiler rivet steel; No. 25, engine-bolt iron. Copies are for sale by the Superintendent of Documents, Government Printing Office, at 5 cents each.

Railway Development in Ecuador

Commerce Reports, issued by the Bureau of Foreign and Domestic Commerce in a recent issue contains a communication on trade conditions in Ecuador, from Consul General Frederic W. Woding, Guayaquil, in which he says:

There are four railways under construction, which will be completed in the near future. The one to the coast is being constructed by the municipality of Guayaquil, under the direction of an American engineer, extending from this city to Salinas on the coast, with a branch line from Amens to Playas. More than two-thirds of the roadbed is finished, including most of the culverts. All explosives and tools used are purchased in the United States. The Quito-Esmeraldas Railway extends north from Quito, eventually to reach Tulcan, then west to Esmeraldas; about 20 miles of the roadbed have been finished, including many concrete bridges and culverts. It is a government work. The Ambato-Curaray Railway starts at Ambato, the eastern terminal to be at Curaray on the eastern side of the Andes Mountains. It is completed to Pelileo, about 30 miles, and is in operation. All materials used were purchased in the United States, and it is being built by American engineers. The Babahoyo Railway is to extend toward Quito. The grading for some 15 miles is finished.

Japanese Railways Will Guarantee Freight Delivery On Time

The Japanese Government Railways Bureau has inaugurated a new system of freight transportation as from January 16. This new system consists in guaranteeing the delivery within a fixed period of time of all shipments. This innovation on the government railway service has been considered for some time, with a view to facilitating commercial transportation overland. On application the government railways guarantee the delivery of consignments in a fixed period, which is worked out on the basis of the time required for preparations for forwarding, the time required for transportation on lines, the time required for ferry transportation in case of cargo being carried beyond the main island of Japan, and the time required for delivery. When cargo is overdue or delay is caused in delivery, freight charges are rebated at officially fixed rates; when delay is within two days, 10 per cent of charges is rebated; when overdue beyond 10 days, 10 per cent of the charges is repaid. However, when the delay is caused by unavoidable circumstances, such as examination by the police officers of customs authorities, or accidents, the railways do not take any responsibility. Under this system baggage signed at Tokio will reach Osaka within four days. Ordinary cargo will reach there within six days. By express train, cargo will reach Osaka within four days. The full text of the new regulations was published in the Official Gazette of December 12. An increase of about 20 per cent in freight rates and passenger fares came into force on the Imperial Japanese Railways on September 1 last.

Concession for Projected Peruvian Railway

By a Government decree dated December 27, 1918, advises Consul General W. W. Handley, Callao-Lima, Felipe Marincovich has been granted a concession to make the studies and surveys necessary for the construction of a railway from the town of Sayan, the present terminus of the Northwestern Railway of Peru (a narrow-gage railway which runs from Ancon on the coast to Sayan via Huacho, and operated by the Peruvian corporation) to the Checras coal fields.

The preliminary plans are to be presented within one year. On the basis of these plans it is expected that arrangements will be made with the concessionaire for the construction and exploitation of this railway.

General News Department

The Montana House of Representatives has passed a joint resolution requesting Congress to return the railroads to private operation as soon as possible.

The Virginian Railroad has abolished the office of general manager, and has dismissed about 100 men, because of dullness in the coal traffic, which normally furnishes 90 per cent of the road's business.

The loans to be made by the War Finance Corporation to railroads, secured by the Railroad Administration certificates of indebtedness, will be on demand notes at 6 per cent for 80 per cent of the face of the certificates or 100 per cent if additional collateral is furnished.

Two employees of the claim department of the Virginian Railroad were arrested at Norfolk, Va., on March 19, charged with selling unclaimed freight at private sale, instead of by auction as is required by the rules, and also with having retained money realized from such sales. One of the men is divisional claim agent, and the other is a chief clerk.

Telephone rates in Massachusetts, established by the postmaster general, will not be disturbed by the Supreme Court of that state. Acting on a petition for reduction of toll rates presented by the Massachusetts Public Service Commission, against the New England Telephone & Telegraph Company, the court held that the United States was a party involved and could not be sued.

One hundred and forty-seven train despatchers of New York City and vicinity held a meeting at Hotel Biltmore, New York, on Monday last and organized the New York Assembly of the American Train Despatchers' Association. The purpose of the assembly is to promote sociability and educate despatchers by debates on co-operation, efficiency, economy, safety, train rules, etc. O. H. Braese (N. Y. C.), was elected chairman of the Assembly.

The striking clerks of the Nashville, Chattanooga & St. Louis, the Tennessee Central and the Western & Atlantic have been ordered back to work by the officers of the Brotherhood of Railway Clerks, who held that the strike was unauthorized, and large numbers of them appeared at the railroad offices on Monday morning of this week seeking reinstatement. The policy of the Nashville, Chattanooga & St. Louis, as announced by W. L. Mapother, federal manager, is to reinstate the men as fast as they can be assimilated, but not to take the strikers back in a body. Officers of the clerks' brotherhood held a conference with officers of the Railroad Administration at Washington last week, and it is understood that the grievances of the clerks against the federal auditor of the Nashville, Chattanooga & St. Louis system, which were the cause of the strike, will be given consideration by the Railroad Administration's Board of Adjustment No. 3. A press despatch from Chattanooga says that but a small percentage of the men and women who walked out were taken back by the road, as their places had been pretty well filled with substitutes, who will be retained. In one office it was stated there were open only fifteen places for the 48 who walked out.

Livestock Losses on Railroads in the Southwestern Region

At a conference of claim agents representing the railroads of the Southwestern region called for the purpose of solving the problem of livestock losses that annually run into millions of dollars, the statement was made that during 1918 railroad trains in Louisiana killed enough livestock to furnish meat for an entire army division for three months, or enough to furnish two pounds of meat to each man. woman and child in the state. Proportionate losses have been sustained in other states of the Southwest region, including Texas, Oklahoma, Arkansas and Missouri. A campaign of education for railroad employees is to be inaugurated as a result of the conference.

Inspection of Automatic Stops on C. & E. I.

The Automatic Train Control Committee which was appointed by the Railroad Administration on January 14 to investigate train control devices made its first inspection trip on Friday and Saturday of last week when it went over the installation of the Miller train control system which is in service on the main line of the Chicago & Eastern Illinois, between Chicago and Danville, Ill. The committee examined the apparatus in the shops of the train-control corporation at Danville on Thursday afternoon, and on the following day a number of tests were made on the road by stopping trains, etc. The committee then visited the railway shops and roundhouse where the engines in service are inspected and maintained. All of the members of the committee were present except C. A. Morse, chairman, who was confined to his room at his hotel in Chicago by illness. Because of Mr. Morse's sickness the further trip to inspect other train control installations in the West was postponed until about the middle of April.

Chicago Commerce Association on Railroad Regulation

The executive committee of the Chicago Association of Commerce has adopted a resolution addressed to Congress containing 11 points embracing the question of railway ownership, operation and control. The reforms recommended are, briefly: (1) that railroad legislation should be the first that may be enacted, (2) that the ownership of the railroads should be in private hands, (3) that operation of the railroads should be left in the hands of experienced men with the government having no part or influence in the appointment of such officers, (4) that existing lines and companies be consolidated to induce economy of equipment, terminal facilities and operation, (5) that recognition be given the transportation needs of sparsely populated districts, (6) that freight and passenger rates be fixed at a figure that will give a fair return on a proper capital valuation, (7) that a regulatory body be provided to fix rates and provide good service, (8) that this regulatory body approve extensions of existing lines or the construction of new lines, (9) that this body also consent to the issuance of new securities, (10) that all questions of wages and conditions of service be placed in the hands of a commission, whose findings shall be final, and (11) that measures be adopted to protect the railways from state laws that interfere with the operation of the lines.

Liability of Railroads to Capital Stock Tax

Under section 407 of the Act of Congress of September 8, 1916, every domestic corporation was required to pay annually a special excise tax with respect to the carrying on or doing business, equivalent to 50 cents for each $1,000 of the fair value of its capital stock. The act approved February 24, 1919, increased the tax to $1 for each $1,000, and reduced the exemption from $99,000 to $5,000. Questions have been raised as to the liability to the capital stock tax of corporations owning railroads controlled and operated by the federal government, and for the purpose of determining the matter the Secretary of the Treasury has announced a decision that:

(1) A corporation owning a railroad operated by the federal government may, without incurring liability to this tax, (a) maintain its corporate organization; (b) own property; (c) collect and distribute the income therefrom; (d) purchase stocks and bonds of other organizations; (e)

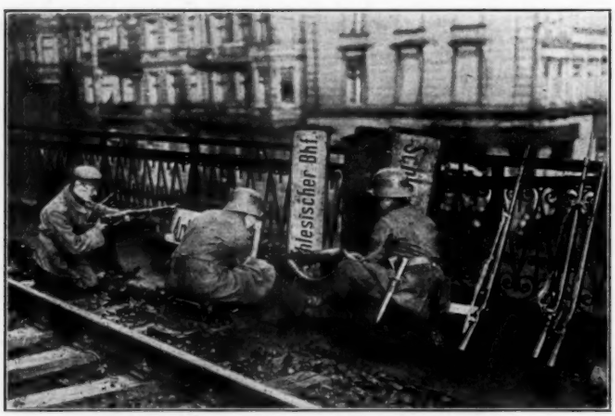
sell all or part of the property used in the operation of its railroad or other business; (f) enter into long-term leases whereby it is divested of control of and is not obligated to maintain the property; and (g) borrow money for the purchase of government bonds or for the financing of obligations previously incurred.

(2) A corporation will incur liability if it (a) manages, (b) maintains, or (c) purchases railroad or other tangible property; (d) sells property not used in the conduct of the railroad or other business; (e) borrows money for the financing of new operations; or (f) makes leases of property held for renting purposes, or whereby it is obligated to maintain the property. The extent of the activity, if it is of a kind causing liability to incur, is unimportant. Each corporation owning a railroad under federal control and claiming exemption from the tax will be required to file an affidavit supplying certain information.

Engineering Advertisers' Association Formed

Advertising and sales managers representing manufacturers in various engineering lines, at a meeting recently held in Chicago, formed the Engineering Advertisers' Association as a means of friendly interchange of ideas and business methods pertaining to the advertising and selling of engineering products and to provide a medium where there might be free discussion of problems arising in this particular field. Active membership in the association is open only to those in responsible charge of advertising or sales of companies selling engineering products. Meetings of the association will be held monthly except during July and August and the annual meeting will be held in March. Provision has been made to accept as associate members publishers and their representatives, solicitors and service agency men whose interests are confined to engineering projects.

H. L. Delander, advertising manager of the Crane Company, Chicago, was elected president, H. Colin Campbell, director of advertising for the Portland Cement Association, Chicago, vice-president; G. H. Eddy, publicity manager of the Green Engineering Company, East Chicago, Ind., secretary and Edward J. Pratt, advertising manager of the Kellog Switchboard & Supply Company, Chicago, treasurer. The board of directors is composed of G. S. Hamilton, advertising manager of the American Steam Conveyor Corporation, Chicago, J. J. Arnsfield, advertising manager of Fairbanks, Morse & Company, Chicago, A. P. Hauck, director of advertising of the Allis-Chalmers Manufacturing Company, Milwaukee, Wis., H. W. Clark, advertising manager of the Chicago Pneumatic Tool Company, Chicago, C. A. Powers, advertising manager of the Benjamin Electric Manufacturing Company, Chicago, and J. C. Kinsley, secretary of the C. M. Davis Regulator Company, Chicago.



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Spartacus Soldiers Defending the Silesian Station in Berlin

Traffic News

The Chicago Passenger Club, an organization of about 450 passenger ticket men of Chicago and surrounding suburbs, claims the distinction of being the only railway club that remained intact during the war.

William H. Spears, district passenger agent of the American Express Company at Chicago, has resigned that position and has been appointed secretary and manager of the T. & S. Tours Company at Chicago. The offices of the new organization will be in the Western Union building, and the company will conduct a national parks and general steamship ticket business.

The Wholesale Merchants' & Manufacturers' Association of Buffalo, N. Y., L. W. Elias, president, is preparing to run a special train through western New York and Pennsylvania on May 20, 21, 22 and 23, to renew friendships between Buffalo merchants and retailers in that region. About 35 towns will be visited and it is expected that 150 representatives of Buffalo business concerns will go on the trip.

The Traffic Bureau of Savannah, Ga., has been abolished. It appears that the bureau was maintained by the city, and the city administration is now being criticized by business men for taking away an element vital to the prosperity of the city. At a largely attended meeting on March 21 a strong plea was presented for the restoration of the bureau.

Consolidation of the army embarkation service and its inland traffic service has been announced by the War Department. Brigadier General Frank T. Hines, chief of embarkation, has been appointed chief of the consolidated service (which will be known as the transportation service) "with responsibility for and authority over the transportation of supplies and the personnel of the army by rail and water."

The Wisconsin Poultry, Butter & Egg Association at a recent meeting adopted resolutions advocating the placarding of cars laden with eggs in order to notify train men to take care in switching. The economic loss to the country because of breakage and damage to eggs in transit from western farms to eastern markets is large and these losses are a serious indirect tax upon the entire trade. The resolutions will be sent to Washington and to the regional directors.

Despite the continued unsettled labor conditions at the port of New York, grain is being cleared actively in considerable quantities at all North Atlantic ports with the exception of Newport News. The Railroad Administration reports, for the week ended March 20, 21,491,000 bushels of grain in elevators at these ports, or about 90 per cent of capacity. There were received during the week 4,473,000 bushels, while 3,935,000 bushels were cleared. At South Atlantic and Gulf Ports there were 12,585 carloads of export freight on hand as against 11,821 for the week previous.

Major-General William M. Black, Chief Engineer, United States Army, speaking before the New York Traffic Club on March 25 declared that the railroads of the country had exterminated inland water traffic. Continuing, he said:

"Are not our common carriers simply agencies of the people for the general good? One class of our carriers has been permitted so to order its business as practically to wipe out another class. As a general proposition inland water transportation has been killed. This has been accomplished by a manipulation of railroad freight rates, rendered more easy by an arbitrary system of freight classification. In what other class of business is a scale of charges permitted which is independent of the scale of values of the service rendered? Where else within our country is it permitted to make one charge to one community and a different charge to another for the same article? Is there any insuperable difficulty in devising a just system of rates, a freight classification based on the cost of handling and moving freight? In the case of competing roads of unequal length, cannot the scales of charges be adjusted to the cost by the cheapest line? Would not this be exactly in line with the practice of manufacturers in general?"

Equipment and Supplies

Trade Acceptances Not to Be Used

It was announced Thursday that the plan of financing the obligations of the Railroad Administration to equipment companies by means of trade acceptances had been abandoned because of complications, and that a substitute plan would be adopted somewhat similar to that of issuing certificates of indebtedness to the railroads.

485 Locomotives and 1,986 Cars Sold to French Government

The French government, through the French High Commission, has bought from the Director General of Military Railways 485 standard gage, Pershing type locomotives now being built by the Baldwin Locomotive Works and 19,860 freight cars of various types that were under manufacture in the United States when the armistice was signed. There remains a comparatively small number of locomotives and cars yet to be disposed of and it is expected that they will be sold to some of the Allied governments.

Locomotive Deliveries to March 15

The following new locomotives were shipped to railroads under federal control during the week ended March 15:

Works	Road	Number	Type
American	G. R. & I.	5	USRA Mikado.
	Penn. L. W.	5	Santa Fe.
	Erie R. R.	5	USRA S. Fe.
	Chic. & N'w.	4	USRA 6W. Sw.
	P. & L. E.	5	USRA Mikado.
	Cent. of Ga.	2	Mallet.
	P. McK. & Y.	5	USRA Mikado.
	A. C. L.	3	USRA Pacific.
	Cent. of Ga.	1	Mountain.
	T. & P.	2	USRA 6W. Sw.
	Chic. G. W.	1	USRA 6W. Sw.
		38	
Baldwin	A. T. & St. Fe.	2	Mikado.
	Union Pacific	1	Pacific.
	Ill. Cent.	2	Mikado.
	Great Northern	2	8W. Sw.
	Penn. L. W.	1	Mikado.
	C. C. & O.	1	Mikado.
		9	
Total		47	

Delivery of Standard Cars to March 1

The Railroad Administration has issued the following statement of the delivery of U. S. R. A. standard cars as of March 1:

Car Deliveries to March 15

The following is a statement of the new standard cars accepted during the week ended March 15:

Road	Number	Type	Manufacturer	Total accepted for given roads
C. C. & O.	31	50-ton S. S. Box	Bettendorf Co.	124
N. Y. C.	140	50-ton S. S. Box	Haskell & Barker	917
Norfolk & Western	36	50-ton S. S. Box	Pullman Car Co.	36
L. & N.	20	50-ton Comp. Gon	Am. Car & Fdy. Co.	129
N. Y. C.	110	70-ton L. S. Gon	Pressed Steel Car	345
Total	337			

Locomotives

THE PENNSYLVANIA EQUIPMENT COMPANY, Philadelphia, Pa., is in the market for a second hand, 4-ton, Westinghouse narrow gage electric locomotive.

Freight Cars

THE A. J. ALSDORF COMPANY, Chicago, is inquiring for the iron work for 100 to 200 twenty-ton freight cars for export.

THE MAGNOLIA PETROLEUM COMPANY has ordered 5 10,000-gallon tank cars from the American Car & Foundry Company.

THE PENNSYLVANIA EQUIPMENT COMPANY, Philadelphia, Pa., is in the market for 50 steel hopper and 50 steel gondola cars of 100,000 lb. capacity.

Passenger Cars

THE PENNSYLVANIA EQUIPMENT COMPANY, Philadelphia, Pa., is in the market for three combination passenger and baggage cars.

Iron and Steel

Steel Rails for Sale By War Department

The office of the chief of engineers of the War Department, Washington, advises that the government plans to sell at prevailing market prices, the surplus stock of 80-lb. rail and 25-lb. rail ordered for the American Expeditionary Forces overseas, but not required due to the signing of the armistice. There are about 50,000 tons of 80-lb. rail and about 7,000 tons of 25-lb. rail. There are large quantities of crossings, slip switches, and turnouts. The bulk of this material is at port readily accessible for loading. All sales are being conducted through the office of the director general of military railways, Washington, where further information can be obtained.

DELIVERY OF STANDARD CARS TO MARCH 1

Type	Manufacturer	A. C. L.	B. & L. E.	B. R. & P.	C. C. & O.	C. & W. C.	C. & N'n.	B. & O.	C. C. & St. L.	C. & S.	Georgia	I. C.	K. M.	L. & N.	M. C.	M. P.	N. C. & St. L.	N. Y. C.	N. Y. N. H. & H.	P. M. & Y.	T. & O. C.	Total
40-ton	D. S. Box	906	...	...	...	300	1250	500	1000	...	...	...	...	...	...	16	...	1000	...	...	250	....
50-ton	S. S. Box	...	...	...	...	...	500	...	...	...	...	...	...	...	500	...	...	...	...	430	...	....
50-ton	S. S. Box	...	...	...	...	...	500	...	...	...	300	...	...	...	...	...	...	625	...	...	...	....
50-ton	S. S. Box	...	...	...	...	...	...	...	...	...	...	...	...	...	500	...	...	...	...	...	...	....
50-ton	S. S. Box	...	...	...	61	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	....
50-ton	Comp. Gon.	...	...	...	...	...	500	250	...	...	...	...	...	336	400	...	58	500	...	...	...	....
50-ton	Comp. Gon.	...	...	...	...	...	...	...	...	...	...	150	...	...	...	...	...	...	...	...	...	....
50-ton	Comp. Gon.	50	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	....
50-ton	Comp. Gon.	250	...	...	...	...	500	...	...	...	...	50	...	...	200	...	...	...	...	...	...	....
50-ton	Comp. Gon.	...	...	...	...	...	...	500	...	...	100	500	...	400	200	...	...	500	...	...	...	....
50-ton	Comp. Gon.	...	...	...	...	...	...	250	...	...	...	300	...	200	200	...	...	...	...	...	...	....
55-ton	St. Hopper	...	250	...	250	...	...	...	200	...	...	...	...	...	...	...	...	...	...	...	500	....
55-ton	St. Hopper	...	...	...	...	...	...	...	...	...	...	150	...	...	...	...	...	...	...	...	...	....
55-ton	St. Hopper	...	...	500	250	...	...	...	200	...	...	200	300	400	...	...	...	500	400	...	...	....
55-ton	St. Hopper	...	...	300	...	...	...	...	200	300	...	250	...	200	...	...	...	...	500	...	...	....
55-ton	St. Hopper	...	...	...	...	...	...	...	200	...	...	200	200	...	...	...	...	...	200	...	...	....
55-ton	St. Hopper	...	250	...	250	...	...	...	200	...	...	200	...	400	...	...	...	500	400	...	...	....
70-ton	St. Hopper	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	145	...	...	...	....
Total		1206	500	800	811	300	3250	1500	2000	300	400	2000	500	1936	2000	16	58	3770	1500	430	750	24,027

Iron and Steel Prices Reduced

Representatives of the steel industry and the Industrial Board of the Department of Commerce at a conference in Washington last week reached an agreement on a schedule of reduced prices for the principal articles of iron and steel which will apply to all purchases by the various government departments and below which the board says the public should not expect to buy during the current year. The purpose was to bring about such a lower level of prices as will effect stability and stimulate trade to the end that business and industry can proceed and build up with confidence a profitable maximum employment. The price schedule is of especial interest to the railroads, which are the largest purchasers of steel, and as the government is operating most of the railroads the prices will apply to purchases for railroad use. The reduction in standard rail prices is from $55 for Bessemer and $57 for open hearth, to $45 and $47, respectively, which sets the price at approximately the figure which was set before the United States entered the war, although practically all railroad contracts were placed at a lower figure under the option given on orders for future delivery at the time the prices were increased. No orders were placed by the Railroad Administration during 1918 and the prices of $55 and $57 applied only to some comparatively small purchases by the Army and Navy Departments. The schedule agreed upon, which is effective at once, is as follows:

	November 11 price	Present price	New price	Reductions From November 11	Reductions From present
Pig iron basic	33.00 G.T.	30.00	25.75	7.25	4.25
Billets 4-inch	47.50 G.T.	43.50	38.50	9.00	5.00
Billets 2-inch	51.00 G.T.	47.00	42.00	9.00	5.00
Sheet bars	51.00 G.T.	47.00	42.00	9.00	5.00
Slabs	50.00 G.T.	46.00	41.00	9.00	5.00
Skelp sheared	3.25 cwt.	3.00	2.65	12.00 N.T.	7.00 N.T.
Skelp universal	3.15 cwt.	2.90	2.55	12.00 N.T.	7.00 N.T.
Skelp grooved	2.90 cwt.	2.70	2.45	9.00 N.T.	5.00 N.T.
Merchant bar—base	2.90 cwt.	2.70	2.35	11.00 N.T.	7.00 N.T.
Sheared plates	3.25 cwt.	3.00	2.65	12.00 N.T.	7.00 N.T.
Structural—base	3.00 cwt.	2.80	2.45	11.00 N.T.	7.00 N.T.
Wire rod	57.00 G.T.	57.00 G.T.	52.00 G.T.	5.00 G.T.	5.00 G.T.
Plain wire	3.25 cwt.	3.25	3.00	5.00 N.T.	5.00 N.T.
Nails	3.50 cwt.	3.50	3.25	5.00 N.T.	5.00 N.T.
Black sheets, No. 28	5.00 cwt.	4.70	4.35	13.00 N.T.	7.00 N.T.
Blue annealed No. 10	4.25 cwt.	3.90	3.55	14.00 N.T.	7.00 N.T.
Galvanized sheets No. 28	6.25 cwt.	6.05	5.70	11.00 N.T.	7.00 N.T.
Tin plate No. 100 box	7.75	7.35	7.00	15.00 N.T.	7.00 N.T.
Tubular products	3½ points off card				7.00 N.T.
Hoops—base	3.50 cwt.	3.30	3.05	9.00 N.T.	5.00 N.T.
Light rails	3.00 cwt.	2.70	2.45	11.00 N.T.	5.00 N.T.
Rails standard Bessemer	55.00 G.T.	55.00 G.T.	45.00 G.T.	10.00 G.T.	10.00 G.T.
Nails standard O. H.	57.00 G.T.	57.00 G.T.	47.00 G.T.	10.00 G.T.	10.00 G.T.
Ore	No change				

Basing points and differentials unchanged. Prices effective at once.

After careful consideration and full discussion relating to cost of production and all other facts and circumstances relating to the iron and steel industry, the committee of steel men submitted a schedule of proposed reduced prices which, after modifications suggested by the board and accepted by the industry, was approved by the board. A statement issued by E. H. Gary, of the United States Steel Corporation, said the object was to secure a basis which, so far as practicable, would yield a moderate and reasonable return to the investors and at the same time would not disturb wage rates or interfere with wage agreements and, having determined upon prices which it is expected will not be reduced during this year, it is believed that the volume of business will be promptly increased and that furnaces and mills will be operating at a largely increased capacity. A statement issued by the board said it had asked the industry to take the first step toward the readjustment and voluntarily make temporary sacrifices in the interest of all and that while the reduction may involve the necessity of some high cost plants either shutting down temporarily or running at a loss for a period, it is expected that with an increased volume of business soon to be developed a reasonable return to the average and better than average producers will be effected. In view of the higher costs developed throughout the world as a result of the war a return to anything like pre-war prices was regarded as out of the question.

Similar conferences are to be held by the board with representatives of other basic industries. Representatives of the lumber trade met with the board on March 22.

Supply Trade News

George Walter Spahr, formerly sales manager of the Tabulating Machine Company, New York, has been appointed sales manager of the Elliott-Fisher Company.

J. J. Haigh has been appointed assistant district manager of sales for the **Chicago Pneumatic Tool Company,** with headquarters at 175 First street, San Francisco, Cal.

The Chicago Pneumatic Tool Company announces the removal of its Boston, Mass., office to 182 High street. **F. F Eggleston,** district manager of sales, will represent the company in that territory.

The Pollak Steel Company announces that the G. F. Cotter Supply Company, Houston, Texas, will represent it as Southwestern sales representatives. They will endeavor to sell the products, consisting of forgings of all kinds, axles, locomotive parts, as well as the Pollak special heat treated products. This covers the material produced both at the Cincinnati as well as the Chicago works.

C. E. Hague, formerly production engineer of the Mid-West Engine Company, Indianapolis, Ind., has been appointed sales manager of the American Steam Conveyor Corporation, Chicago, manufacturers of the American steam ash conveyor and other ash handling equipment. Mr. Hague assumed his duties March 17.

F. R. Still, vice-president and secretary of the **American Blower Company,** of Detroit, Mich., has left on an extended trip for the far East where he will investigate trade conditions in connection with export work. Mr. Still's itinerary includes Japan, China, Australia and most of the European countries, and he expects to cover approximately 36,000 miles before returning, about November 1.

Captain A. C. Nell, who has been in charge of the purchase of power and mechanical equipment for the construction division of the United States Army, has been released from active duty in the army and has been appointed district manager for the Lea-Courtenay Company and the Schutte-Koerting Company, with offices in the Conway building, Chicago. Mr. Nell was formerly connected with the Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

P. Harvey Middleton, executive assistant of the Railway Business Association, was invited by Señor M. Muñoz, general superintendent of the Mexican National Railway Administration, during his visit to New York this week, to make a trip with him over all the lines under the control of the Carranza government. Mr. Middleton has accepted the invitation and will leave for Mexico shortly. He will be met at Laredo, Texas, by Señor Muñoz and will visit all points of interest, including the steel mills and railway machine shops. Mr. Middleton speaks Spanish, which will aid him greatly in his investigations.

W. J. Austin, general manager of **The Austin Company,** industrial engineers and builders, Cleveland, Ohio, has just returned from a three-months' trip to France, Belgium and England. Mr. Austin, in company with J. K. Gannett, export sales manager of the Austin Company, sailed from New York City on December 5. The party which included Alvin T. Fuller, member of Congress from New England, were for a time the guests of the British Government and were taken on a thousand-mile trip over the battlefields. The 13 buildings which were erected by the American forces for the U. S. Army Transport Service, under the Austin Company's supervision, were inspected by the party. The first building was erected at St. Nazaire by the 17th Engineers in December, 1917, and the remaining buildings were erected at Verneuil, 30 miles east of Nevers.

Financial and Construction

Railway Financial News

BALTIMORE & OHIO.—This company has sold to Baltimore bankers $3,000,000 five-year 6 per cent collateral trust notes. The security given is the Coal & Coke Railway, which the Baltimore & Ohio acquired about two years ago. The proceeds of the notes, together with other funds borrowed from the War Finance Corporation, will be used to pay off at their maturity, on April 1, an issue of $5,000,000 Coal & Coke Railway 5 per cent mortgage bonds.

The notes are being offered at 97½ and interest, to yield about 6.60 per cent. Holders of the maturing bonds have the prior right to take the new notes. The Baltimore syndicate is headed by the Mercantile Trust & Deposit Company, Robert Garrett & Sons, Baker, Watts & Co., and Townsend, Scott & Sons.

NEW YORK CENTRAL.—The Court of Appeals has handed down a decision unanimously affirming, without opinion and with costs, the judgment dismissing the complaint on the merits in the action brought by Clarence H. Venner against the New York Central Railroad and other companies constituting the New York Central lines. The purpose of the action was to prevent or undo the consolidation of the New York Central & Hudson River Railroad with the Lake Shore & Michigan Southern Railway, which was accomplished in December, 1914. The plaintiff Venner also sought, in case his effort to undo the consolidation was unsuccessful, to destroy the unity of control of all the railroads of the Vauderbilt system and attacked not only the Harlem Railroad lease made in 1873, the West Shore lease made in 1885, the Michigan Central control obtained in 1878, the Nickel Plate control obtained in 1882, but that of the Big Four, the Lake Erie & Western, the Toledo & Ohio Central and other lines. His contention briefly stated was that the unity of control of those lines violated the Sherman act and the anti-trust and anti-monopoly statutes of the six states through which the railroads of the New York Central system extend.

PENNSYLVANIA.—At the annual meeting held in Philadelphia on March 25, George Wood, C. Stuart Patterson and Clement B. Newbold were elected directors to serve for four years. The resolution approving of the increase of the company's indebtedness to the extent of $75,000,000, upon which, at the stockholders' annual meeting, a stock vote was ordered to be taken at the same time, was adopted.

WESTERN MARYLAND.—J. Kemp Bartlett, of Baltimore, has been elected a director.

Railway Construction

OREGON, CALIFORNIA & EASTERN.—Robert E. Strahorn, president of the Oregon, California & Eastern with offices at Spokane, Wash., is supervising the completion of a 20-mile railroad from Klamath Falls, Ore., to Dairy, which will be the first link of a projected railway into Central Oregon. The new line will extend from Bend, Ore., to Silver Lake, at which point it will branch, one line running to Klamath Falls and the other line to Lake View, Ore. Another line will extend from Bend to Crane and will connect the Oregon Short Line at the latter point with the Oregon Trunk and the Oregon-Washington Railroad & Navigation Company at Bend. The new line will connect the Oregon Trunk and the Oregon-Washington Railroad & Navigation Company at Bend with the Southern Pacific at Klamath Falls and the Nevada, California & Oregon at Lake View. The company also plans to complete a seven-mile spur from Dairy, Ore., to Bonanza this fall, the farmers having agreed to furnish the grade and ties if the company will lay the steel and operate train service.

Railway Officers

Railroad Administration

Federal and General Managers

George E. Johnson, who has been appointed assistant to the general manager of the Denver & Rio Grande, the Rio Grande Southern, the Denver Union Terminal, the Pueblo Union Depot and the Salt Lake City Union Depot, with headquarters at Denver, Colo., began his railway career in August, 1897, as a clerk in the freight agent's office on the Minneapolis & St. Louis, at Minneapolis, Minn. Until December, 1907, Mr. Johnson served in various positions with the Great Northern, including clerk and chief clerk to the superintendent, the assistant general superintendent and the general superintendent; assistant superintendent, inspector of transportation, and assistant to the general superintendent. During the following ten years he served as chief clerk to the general superintendent and to the general manager; trainmaster and superintendent on the Spokane, Portland & Seattle and affiliated lines. Prior to his recent appointment he was general superintendent of the Gales Creek & Wilson River (under construction), with headquarters at Portland, Ore.

Operating

A. M. Smith has been appointed superintendent on the Western Maryland, with headquarters at Hagerstown, Md.

J. D. Stack, general manager of the Virginian Railroad, with office at Norfolk, Va., has resigned and his former position has been abolished.

H. E. McGee, general superintendent of the Missouri, Kansas & Texas of Texas, with office at Dallas, Texas, has had his authority extended over the Wichita Falls & Northwestern.

H. C. Ferris, receiver and chief operating officer of the Missouri, Oklahoma & Gulf, with office at Muskogee, Okla., has been appointed general superintendent of the same road, with office at Muskogee.

W. M. Whitenton, superintendent of the Missouri, Kansas & Texas, with office at Muskogee, Okla., has been appointed general superintendent of that road and the Oklahoma Belt, with headquarters at Parsons, Kansas, vice **W. E. Williams** resigned to accept service with other lines.

Major Mott Sawyer, who served in the aviation service of the United States Army, has been discharged from military service and has been appointed assistant to the general superintendent of the Chicago, Milwaukee & St. Paul, lines west of Mobridge, with office at Seattle, Wash. Major Sawyer was superintendent of the same road, with office at Tacoma, when he entered military service.

Captain Frank O. Fernald, Engineers, U. S. A., commanding Company F., 147th Engineers, has received his honorable discharge from the army and has been re-appointed superintendent, operating department, Pullman Car Lines, U. S. R. A., at Dallas, Texas. Captain Fernald was formerly engaged in railway construction and maintenance of way in the Northwest.

C. L. Beals has been appointed trainmaster on the Illinois Central, at Fordham, Ill., to succeed **T. Whitby**, who has been transferred to trainmaster of freight service south of Twenty-seventh street, Chicago, with headquarters at Fordham, succeeding **C. R. Smith**, who has been transferred to the territory north of Twenty-seventh street, with headquarters at Chicago, in place of **F. Ehretsman**, deceased.

The following appointments have been made on the Missouri, Kansas & Texas and all the roads under the jurisdiction of **C. N. Whitehead**, federal manager, with headquarters at St. Louis, Mo.: **O. C. Smith**, superintendent of transpor-

tation, at Dallas, Tex.; **W. H. Hall,** superintendent of telegraph, at Denison, Tex., and **J. L. Walsh,** superintendent of safety, at Dallas, Tex.

W. Mosby, superintendent of car service of the St. Louis-Southwestern of Texas, the Missouri, Kansas & Texas of Texas, the International & Great Northern and the Galveston, Houston & Henderson, has been appointed superintendent of transportation of the St. Louis-Southwestern, the St. Louis-Southwestern of Texas, the Eastern Texas, the Dallas Terminal & Union Depot, the Southern Illinois & Missouri Bridge and the Louisiana & Arkansas, with headquarters at Tyler, Texas; **W. J. Williams,** assistant superintendent of telegraph of the Louisiana & Arkansas, has been appointed superintendent of telegraph of the St. Louis Southwestern and affiliated roads, with headquarter at Tyler, Texas; **E. Richards,** assistant superintendent of safety of the Louisiana & Arkansas and the St. Louis-Southwestern, has been appointed superintendent of safety of the above roads, with headquarters at Mount Pleasant, Texas; **L. M. Hill,** superintendent of dining and parlor cars of the Missouri Pacific and the St. Louis-Southwestern, has been appointed superintendent of dining cars of the latter road and its affiliated lines, with headquarters at St. Louis, Mo.

Financial, Legal and Accounting

Ernest Gent, chief clerk in the accounting department of the Illinois Terminal and the Missouri & Illinois Bridge & Belt, has been appointed acting federal treasurer of these roads, with headquarters at Alton, Ill., to succeed **K. E. Wilson,** resigned.

E. T. Nelson, paymaster of the Missouri, Kansas & Texas, with office at Parsons, Kan., has been appointed acting federal treasurer of the Missouri, Kansas & Texas of Texas, with headquarters at Dallas, Texas, vice **W. O. Hamilton** resigned to accept service elsewhere.

Traffic

W. V. Galbreath, general live stock agent of the Missouri, Kansas & Texas of Texas, with office at Ft. Worth, Texas, has had his authority extended over all the other roads under the jurisdiction of **C. N. Whitehead,** federal manager, with headquarters at St. Louis, Mo.

J. R. Wells, whose appointment as assistant general passenger agent of the Southern Railroad lines, with headquarters at New Orleans, La., has already been announced in these columns, was born on December 17, 1870, at New Orleans, and was educated in the Jesuits College of his native town. He began railway work in November, 1896, in the passenger traffic department with the New Orleans & North Eastern, part of the Queen & Crescent Route. He served continuously in that department and with the Southern Railroad lines, after the consolidation, until the present time, consecutively as assistant ticket agent, city passenger agent, city ticket agent, district passenger agent and as division passenger agent, at New Orleans.

J. R. Wells

R. H. DeButts, division passenger agent of the Southern Railroad, has been promoted to assistant general passenger agent, with office at Washington, D. C.; **S. E. Burgess,** division passenger agent at Charlotte, N. C., has been promoted to division passenger agent, with office at Washington, D. C., and **R. H. Graham,** division passenger agent at Greenville, S. C., has been promoted to division passenger agent, with office at Charlotte, N. C.

W. M. Fenwick, assistant general passenger agent of the Missouri, Kansas & Texas, has been appointed general passenger agent of that road, and the Oklahoma Belt, with office at St. Louis, Mo. **Randolph Daniels,** division passenger agent of the Missouri, Kansas & Texas of Texas, with office at Dallas, Texas, has had his authority extended over the Wichita Falls & Northwestern. **W. A. Kellond** is now general baggage agent of the Missouri, Kansas & Texas, the Oklahoma Belt, the Missouri, Kansas & Texas of Texas and the Wichita Falls & Northwestern, with offices at Parsons, Kan., and at Dallas, Texas. **W. G. Crush,** passenger traffic manager of the Missouri, Kansas & Texas of Texas, and the Wichita Falls & Northwestern, with headquarters at Dallas, Texas, has had his authority extended over the Missouri, Kansas & Texas and the Oklahoma Belt.

Engineering and Rolling Stock

W. J. McDermott, roadmaster on the Northern Iowa division of the Chicago & North Western, with headquarters at Eagle Grove, has retired from active service after a period of 36 years in the employment of this road. Mr. McDermott is succeeded by **J. Bolan.**

H. H. Johntz has been appointed engineer maintenance of way of the Missouri, Kansas & Texas and the Oklahoma Belt, with headquarters at Parsons, Kan., and **A. E. Triplett,** district engineer of the Missouri, Kansas & Texas of Texas, has been appointed engineer maintenance of way of the same road and the Wichita Falls & Northwestern, with headquarters at Dallas, Texas.

W. H. Vance, engineer maintenance of way of the St. Louis-Southwestern and the Louisiana & Arkansas, has been appointed engineer maintenance of way of the St. Louis-Southwestern lines, including the St. Louis-Southwestern of Texas, the Eastern Texas, the Dallas Terminal & Union Depot, and the Southern Illinois & Missouri Bridge, with headquarters at Tyler, Texas.

The following appointments have been made on the Missouri, Kansas & Texas, and all the roads under the jurisdiction of **C. N. Whitehead,** federal manager, with headquarters at St. Louis, Mo.: **H. P. Anderson,** superintendent of motive power of the Missouri, Kansas & Texas, at Parsons, Tex., has been appointed mechanical superintendent with office at Denison, Tex.; **W. H. Maddocks** has been appointed mechanical engineer, with office at Parsons, Kans., and **R. W. Burnett** has been appointed assistant mechanical superintendent, with office at Denison.

Purchasing

J. E. Anderson, purchasing agent of the Ft. Worth & Denver City; the Ft. Worth & Rio Grande; the Gulf, Colorado & Santa Fe.; the International & Great Northern; the Missouri, Kansas & Texas; the Missouri, Kansas & Texas of Texas, and the Texas Midland, with office at Dallas, Texas, has been appointed assistant purchasing agent of the St. Louis-San Francisco; the Kansas City, Clinton & Springfield; the Paris & Great Northern; the West Tulsa Belt, and the Rock Island-Frisco Terminal, with headquarters at St. Louis, Mo.

Corporate

Engineering and Rolling Stock

Richard W. Moore, general car foreman on the Canadian National, at Cochrane, Ont., has been promoted to district car foreman, with headquarters at Saskatoon, Sask. He was born at Listowel, Ont., on October 20, 1882, and received his education in the Brandon high school of that place. He entered railway service in July, 1906, as a car repairer on the Grand Trunk Pacific, which position he held for two years when he was promoted to car foreman, serving in that capacity for nine years at Melville, Sask., Rivers, Man., and Fort William, Ont. When the National Transcontinental was taken over by the Canadian Government, Mr. Moore was transferred to that road as car foreman. In November, 1917, he was appointed general car foreman, with headquarters at Cochrane, Ont., which position he held until his recent appointment as district car foreman of the Canadian National, with headquarters at Saskatoon.